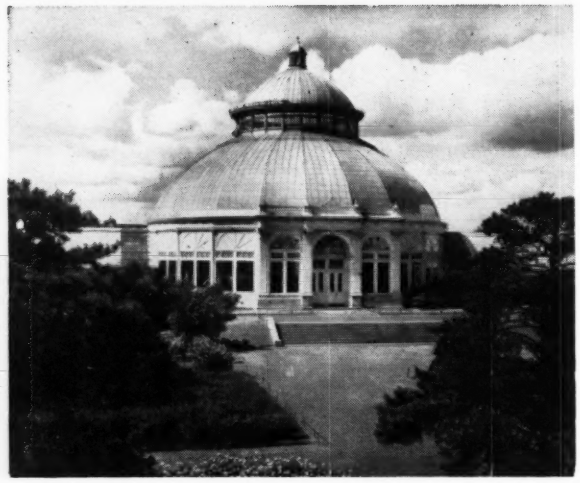
THE GARDEN JOURNAL

OF THE NEW YORK BOTANICAL GARDEN



March 1-31—Exhibit of paintings of botanical and horticultural subjects by Erik Hans Krause, of Rochester, N. Y., in east wing of Museum and Administration Building.

April 27—Special Arbor Day Program at The New York Botanical Garden; also Garden Club Affiliate Day.

April 30—Spring Garden Tour of The New York Botanical Garden to John Bartram's home and four other homes in Fairmont Park, Philadelphia, Pa.

May 17—Annual Meeting of The New York Botanical Garden.

June 7—Fourteenth Annual Rose Day at The New York Botanical Garden.

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DOROTHY EBEL HANSELL

Editor

CONTENTS

March-April, 1956

Modern Pest Control Materials and Practices	*P. P. Pirone*	33
Taking Advantage of Nature	*Sallie F. Cole*	37
Orchids Are Easy!	*Wellington F. Scott, Jr., and Carter Scott*	38
Dried Material—Suggestions for Picking, Drying, and Arranging It	*Beatrice P. Hendrix*	40
What We Can Do About the Introduction of Plants	*John C. Wister*	44
Tempering the Elements With Plants	*C. W. Cares*	46
Planting for Climate Control	*Melva M. Weber*	48
From Mud to Marigolds—Know How to Do It	*A. C. Pfander*	51
Know What to Do	*James M. Gibb*	53
Fanny Stevenson—Gardener	*William J. Robbins*	55
The Exotic Garden of Monaco	*Murray Wright*	56
Grandpa's Letters to Janet		58
Book Reviews		60
News, Notes and Comments		62
Let There Be Herbs	*Gertrude B. Foster*	64

AMONG OUR CONTRIBUTORS

Out of a bewildering array of new plants to grow, new methods and new chemicals with which to treat them, DR. P. P. PIRONE, Plant Pathologist at The New York Botanical Garden, has chosen only the proven plants and the tested methods and products for his latest book, *What's New in Gardening*, published this month by Hanover House (Doubleday). The American Garden Guild Book Club selected it as the February 1956 offer to its members. Dr. Pirone is also author of *Modern Gardening* and *Maintenance of Shade and Ornamental Trees* . . . SALLIE F. (MRS. E. B.) COLE is an alert amateur gardener from Seattle, Washington. She and her husband really know their plants and have done a superb job in developing their home property in such a way as to take full advantage of all that nature offered them . . . WELLINGTON F. SCOTT, JR., and CARTER SCOTT are another husband-wife team. They both derive great fun from their plant hobbies. Mr. Scott writes he has "broken out with titles this year;" he is first vice-president of the American Iris Society and chairman of its committee on awards, also chairman of the Horticultural Council of the Missouri Botanical Garden . . . BEATRICE P. (MRS. STAFFORD) HENDRIX who, with Mrs. Erik A. Thomee, made the arrangements for the exhibit "Lasting Beauty From Unexpected Sources," held in the Museum Building of The New York Botanical Garden last winter, generously shares her knowledge of this art with our readers. Her article answers the many inquiries on how to collect, dry, and use this type of material, which were stimulated by the exhibit . . . JOHN C. WISTER is Director of the Arthur Hoyt Scott Horticultural Foundation at Swarthmore, Pa., and Director of the John F. Tyler Arboretum at Lima, Pa., landscape architect, author, lecturer, and officer, past and present, of many plant societies. Mr. Wister is without doubt one of the best known men in horticulture today . . . The consideration of weather conditions and how to modify them by site planning and proper planting is receiving serious attention these days. The Garden Journal is fortunate in being able to present to its readers two excellent articles on this subject—"Tempering the Elements with Plants" by DR. C. W. CARES, Assistant Professor in the Department of Floriculture and Ornamental Horticulture at Cornell University, and "Plants for Climatic Control" by NELVA M. WEBER, landscape architect. Miss Weber, well known as a designer of private gardens, is a popular lecturer and contributor to magazines and newspapers . . . A. C. PFANDER is Administrator of The New York Botanical Garden . . . JAMES M. GIBB is Superintendent of "Chelmsford," the beautiful country estate of Mrs. Elon Huntington Hooker in Greenwich, Conn. . . . DR. WILLIAM J. ROBBINS is Director of The New York Botanical Garden . . . MURRAY WRIGHT, N.D.H., is Horticultural Advisory Officer for Derbyshire, England, and author of *Plant Propagation*, published in the United States by Criterion Books, New York . . . GERTRUDE B. FOSTER is editor of "Herb Grower Magazine."

CREDIT FOR ILLUSTRATIONS

We are indebted to the Special Display Committee—Mrs. Charles Burlingham, Mrs. Richard Meredith, Mrs. Donald B. Straus—for the selection of the front cover illustrations for The Garden Journal. The front cover illustration this month is from **L'Herbier des Demoiselles**, 3rd ed. 1848, by Edmond Audouit; photograph of original plate by E. N. Mitchell. Pp. 34, 35, 36, E. N. Mitchell; pp. 38, 39, courtesy of W. F. Scott, Jr.; pp. 40, 41, E. N. Mitchell; p. 42, upper left, Seaf Photo Service, center, Fitchburg Art Museum, lower right, Hugelmeyer; p. 43, Roche; pp. 46, 47, sketches by C. W. Cares; pp. 48, 49, 50, sketches by Nelva M. Weber; p. 52, drawn by A. C. Pfander; p. 55, sketch by Spighi; pp. 56, 57, R. C. M. Wright.

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MODERN PEST CONTROL MATERIALS AND PRACTICES

By **P. P. Pirone**

NOT A SINGLE MEMBER of the plant kingdom is completely immune from attack by some insect pest or microorganism. Hence the control of insect pests and diseases is an intrinsic part in the successful culture of food, fiber, and ornamental plants.

Commercial growers of fruits, vegetables, and ornamental plants appreciate the need for controlling insects and diseases, because their margin of profit is frequently governed by the degree of freedom from pests and blemishes in their crops. The home gardener, on the other hand, is less concerned with pest control for two reasons—the investment involved is relatively small, and many plants can be grown reasonably free from pests without the use of pesticides. There are many instances in home gardens, however, when certain pests must be combatted with spray materials if one wants to harvest fruits, vegetables, or flowers of good quality.

This article, written especially for readers of The Garden Journal, will attempt to bring home gardeners up to date on the newest pest control materials.

Never before have so many excellent insecticides and fungicides been available for home gardeners. In fact, so many new kinds have appeared in the last ten years, that older gardeners will not recognize some of them. Chemicals such as arsenate of lead and Bordeaux mixture are rarely used today. These have been supplanted by such materials as ferbam, lindane, malathion, and dieldrin (pronounced deel-drin), to name but a few.

Despite the development of more efficient chemicals for pest control, however, three basic factors still govern their successful use: proper timing of the treatments, thorough coverage of fruit and foliage, and use of the correct material.

The appearances of insect pests, bacteria, and fungi in the spring are closely correlated with the plant's development, and they are all dependent on weather conditions, particularly temperature and moisture.

Insect development is largely dependent on temperatures. Hence if the spring is a cold one, insects will not appear as early as they do in a warm spring. Gardeners, therefore, should delay insecticide applications in cold springs and make them earlier when the spring temperatures are warm. Both time and materials are wasted, when insecticides are applied far in advance of the insects' appearance.

Diseases caused by fungi and bacteria are more dependent on moisture than are insects. Most fungi and bacteria are spread by wind-splashed rain and need water to germinate and to penetrate (infect) plants. The rainier the season, therefore, the more prevalent are the fungus and bacterial diseases. Of course, temperature also plays a part in their development. Warm temperatures hasten the development of fungi and bacteria.

Gardeners ought not wait for diseases to appear before initiating control practices. The protective sprays (fungicides) should be applied weeks before the symptoms appear, and the sprays should then be continued periodically, every week or so, in order to assure maximum control. Proper timing, therefore, is very important in disease control, because success depends on doing the job even while the plants look healthy.

The second factor governing the success of pesticide applications is thorough coverage. All the susceptible parts of the plant must be thoroughly coated with the insecticide or fungicide. This does not mean that one must apply so much material as to actually weigh down the leaves. A fine, evenly distributed coating of spray or dust is all that is necessary. On plants where the insects feed primarily on the lower leaf surface, the insecticide ought to be directed mainly to that surface. Because fungi may penetrate leaves either via the upper or lower surfaces, it is essential that fungicides coat both surfaces thoroughly.

Fungus and bacterial spores are so tiny that they can readily infect plants that have not been completely covered with protectant sprays. I like to present the following comparison to give gardeners an idea of how tiny spores are. Suppose a black spot of rose fungus spore was magnified to an inch in length, then the rose leaf on which it falls to cause infection will actually be more than a thousand inches long!

In early spring when the leaves are expanding rapidly, fungicides should be applied frequently so as to protect newly formed parts. After the leaves reach full size, there is less need for frequent sprays because no new surfaces have formed since the previous spray was applied.

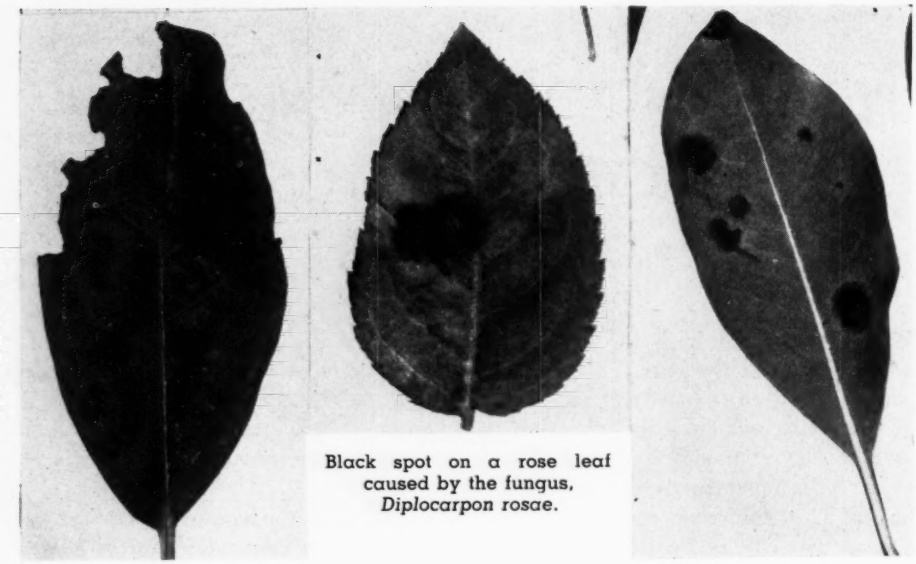
Obviously, the best way to get good coverage of pesticides is to use good spraying or dusting equipment. Any garden supply store and many hardware stores carry an assortment of such equipment.

The selection of the proper pesticide is the third important factor in insect and disease control. Here confusion reigns, because there are more than two thousand different brands of insecticides, fungicides, or combinations of both, on the market. In an attempt to reduce this confusion, I shall present the pertinent facts about the new pesticides in three parts: insecticides, fungicides, and combination sprays.

INSECTICIDES

These fall into three groups: the chlorinated hydrocarbons, the organic phosphates, and the botanicals, or insecticides of plant origin.

The most famous of the chlorinated hydrocarbons, DDT, reached the peak



Black spot on a rose leaf caused by the fungus, *Diplocarpon rosae*.

Injury to rhododendron leaves caused by the black vine, or taxus weevil.

Mountain-laurel leaf infected by the leaf-spotting fungus, *Phyllosticta kalmicola*.

of its popularity only a half dozen years ago. In the last few years its popularity has declined for several reasons. Many insects once readily susceptible have developed a high resistance or are completely immune to its toxic effects. It does not control mites. In fact, it actually tends to increase the mite population on certain plants. The most important reason for its loss of popularity, however, is that more effective materials with fewer undesirable properties have been developed.

DDT still has a place in the control of pests such as borers in trees and shrubs, elm bark beetles which spread the Dutch elm disease, gypsy moth, and in other special situations where a long-lasting residual effect is desired.

Plants like gladiolus and orchids, which are not susceptible to mites, can be sprayed with DDT to control insects such as thrips and weevils. But DDT should not be used to control thrips on privet, because it will encourage mites on that plant. The same holds true for many evergreens like spruce, hemlock, and andromeda.

DDT formulations in wettable powder form, as emulsifiable liquids for use in sprays, and in dust form for dry application are still widely available in garden supply stores. DDT is also available in so-called aerosol bombs, which merely require the pressing of a button for application. Gardeners should be sure to purchase the aerosol bomb prepared for use on plants rather than one designed to control household pests. The latter type is apt to burn plants.

Methoxychlor, a close relative of DDT, controls the same pests as DDT but is less toxic to man and pets and safer to use on vegetables like cucumbers, squash, and tomatoes.

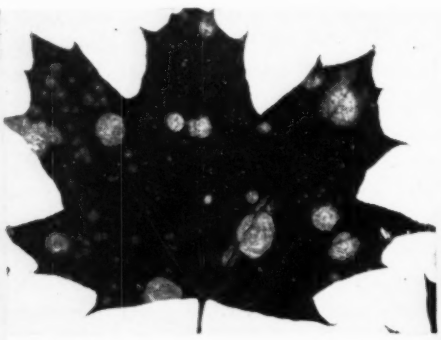
Chlordane, another important chlorinated hydrocarbon, is extremely effective against soil-inhabiting pests such as ants, Japanese beetle grubs, chinch bugs, and sod webworms.

Heptachlor, a close relative of chlordane, controls pests like the apple maggot, plum curculio, onion thrips, cucumber beetle, and European corn borer, in addition to those pests controlled by chlordane.

Endrin, another close relative of chlordane, is one of the most effective materials yet discovered to combat the corn-ear worm.

Lindane, one of the most widely used of the newer chlorinated hydrocarbons, is especially good for controlling lace bugs on rhododendrons, azaleas, andromeda, laurel, hawthorn, and firethorn. It is also excellent for pine bark aphids and other species that have a white cottony covering.

Lindane, or combination sprays containing lindane, has caused foliage burn on a few ornamental plants. Home gardeners should try it, for the first time, on one or two plants before using it on the whole garden. It is not recommended for fruit and vegetable plants, because it imparts an "off" flavor to such plants, particularly if applied near harvest time. For this reason, lindane



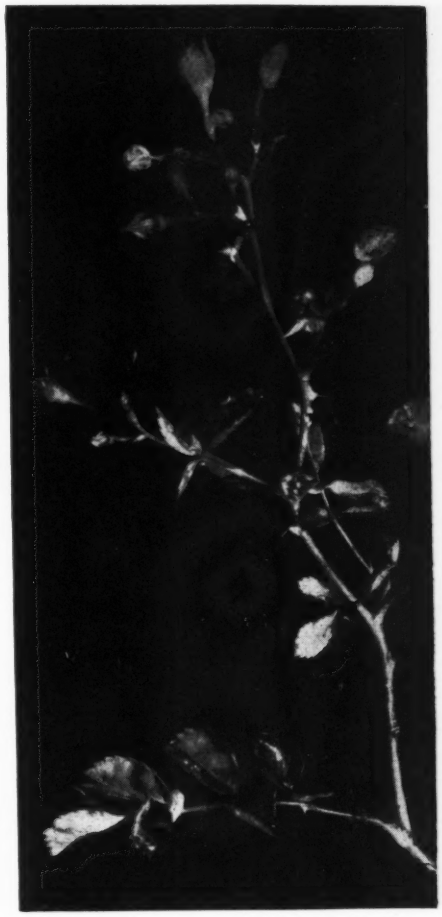
Left. The botrytis fungus blights flower bracts and leaves of dogwood in early spring.

Center. The bull's-eye spot of maples is caused by a fungus belonging to the genus *Sclerotinia*.

Right. The *Septoria* fungus causes severe spotting of chrysanthemum leaves in wet seasons.

Oyster shell scale frequently infests herbaceous peonies, especially when old stems are not cut down each fall.

The cottony maple scale frequently infests dogwood but is also common on dozens of other trees and shrubs.



Powdery mildew is a common fungus disease of roses, especially ramblers.

is recommended primarily for ornamental and non-edible crops.

The newest of the chlorinated hydrocarbons to receive much publicity is dieldrin. It does an excellent job of pest control, particularly of lawn pests such as Japanese beetle grubs, chinch bugs, and ants. It controls lawn insects in three ways: as a stomach poison, a contact insecticide, and as a fumigant.

Dieldrin comes in liquid, powder, or granulated form. In the latter form, it is adsorbed on granular particles of an inert carrier to facilitate spreading it evenly over lawns. These dieldrin granules, like fine grains of sand, sift down through the matted grass where they come in contact with the insect pests. Then, when the lawn is watered, the dieldrin soaks into the ground and kills the grubs.

This unusual chemical is also used as a spray to control the adult stage of the black vine weevil on yews, hemlocks, rhododendrons, laurel, azaleas, and other susceptible plants. The larval stage, which feeds on the roots of strawberries and raspberries can be controlled by spreading a pound of dieldrin to every six thousand square feet of area and then raking it in to a depth of several inches.

Aldrin, a close relative of dieldrin, controls much the same kind of pests. It is a more volatile chemical, however, and hence its effects are not as long lasting.

Aldrin, chlordane, and DDT are also available in granular form for easier application on lawns and in gardens with a lime or fertilizer spreader.

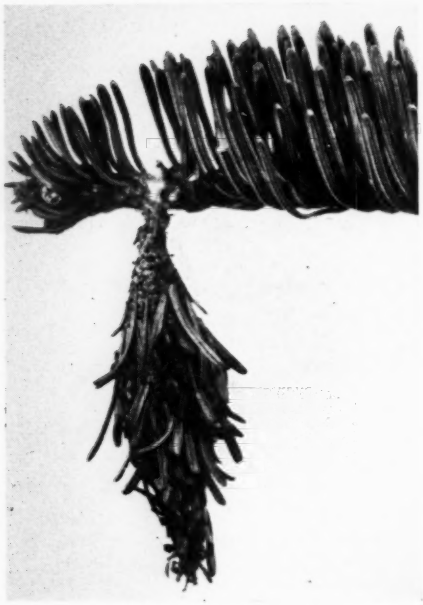
The organic phosphates are the second and, perhaps, most important of the three groups of insecticides. These were originally discovered by the German chemist, Gerhard Schrader. The first one to be put to commercial use was parathion, but it is so dangerous to handle (some people have actually been killed by it) that it is not available to amateur gardeners.

The most widely available organic phosphate for home garden use is malathion. It is probably the best all-purpose insecticide yet developed and, according to the United States Department of Agriculture, among the safest of the organic phosphates to handle.

Here is a partial list of the pests which can be controlled with malathion: aphids, azalea scale, bagworms, birch leaf miner, black scale, euonymus scale, European pine shoot moth, Fletcher scale, Florida red scale, four-lined leaf bug, houseflies, Japanese beetle adult, juniper scale, lace bugs, magnolia scale, mealy bugs, Monterey pine scale, oak kermes, oyster shell scale, pine leaf scale, potato leafhopper, rose leafhooper, scurfy scale, soft brown scale, tarnished plant bug, tent caterpillar, thrips, and white fly.

The crawling stage of scale insects is particularly susceptible to malathion. Hence to achieve maximum control of scales, the malathion should be applied at the time the young scales are crawling about. On outdoor plants, the time that such crawlers appear depends on the species. For example, the crawling stage of the euonymus scale is in June and again in late August, whereas crawlers of the tulip-tree scale appear in early fall. Home gardeners are, therefore, advised to find out when the crawling stage of the scales they want to control occurs.

An unusual property of malathion is that it is capable of controlling mites (which are not insects) in addition to all "hard-to-kill" insects. In this respect it is far superior to DDT, and



The bagworm chews leaves of evergreens such as arborvitae and firs, in addition to leaves of maple, plane tree, sweet-gum, and linden.

this is one of the reasons for its present widespread use.

Malathion is compatible with DDT and lindane. In fact, this combination will serve to control practically every pest that infests a flower garden.

The only drawbacks of this extremely unusual material are: its unpleasant odor when first applied, and its failure to control the leaf nematode of chrysanthemums.

Another organic phosphate widely publicized last year, DDVP, or dimethyl dichloro vinyl phosphate, was discovered by scientists in the United States Public Health Service. Although it will not be available for some time, DDVP is expected to be particularly effective against such pests as aphids, mites, and fruit flies.

Systemic Insecticides

A relatively new approach to insect control is with so-called systemic insecticides. These are applied to the soil, absorbed by the roots and then carried to the leaves, where they kill certain species of insects that feed on the foliage.

Sodium selenate was one of the first systemic insecticides. However, it is so toxic that soils treated with it cannot be used to grow edible crops, because

In recent years the taxus mealy bug has become an important pest of yews.

such crops absorb some of the poison. Consequently, its use is confined to ornamental plants, like chrysanthemums, for control of the leaf nematode.

The two most widely used systemic insecticides presently available are the organic phosphates known by the common names demeton (trade name "Systox") and schradan ("Pestox" 3, OMPA). Aphids and mites on outdoor chrysanthemums and roses can be controlled by drenching the soil with "Systox."

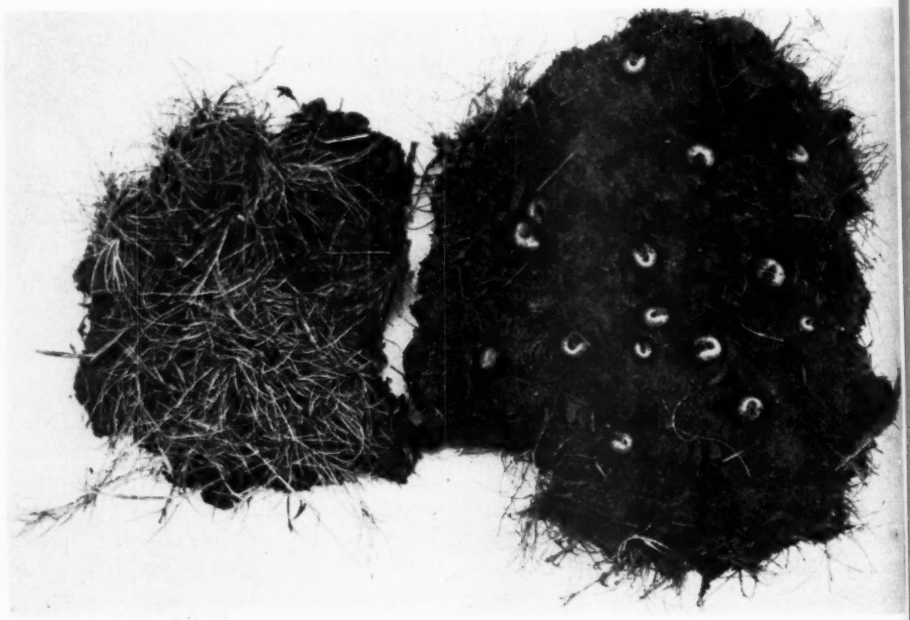
The third group of insecticides, the so-called botanicals, has a place in very special situations. Best known in this group are rotenone and pyrethrins which, incidentally, are among the safest insecticides to use on edible plants, because they are relatively unstable and hence have no prolonged residual effect. Their greatest use is on snap beans, broccoli, lettuce, spinach, and other vegetables. Nicotine sulfate, an old reliable for sucking insects, is also derived from plants and is one of the deadliest of all insecticides in concentrated form. When diluted and applied to plants, however, it quickly loses its deadly properties. It is always more effective if used when the air temperature is above 85° or when diluted and used in lukewarm water. Gardeners who use nicotine sulfate in cool weather will find that aphids do not succumb to the chemical.

Ryania, an extract from the South American shrub *Ryania speciosa,* gives excellent control of the European corn borer and the cranberry fruit worm, with no danger to man and his pets.

Mite Control

Mites are not true insects; hence, most insecticides are not capable of controlling them. The principal exception is malathion, which is not only a good insecticide but also a fairly effective miticide (mite killer).

Agricultural scientists have been hard at work developing chemicals for controlling mites. Among such materials is "Aramite," probably the most widely used of the specific mite killers. It controls European red mite, spruce mite, and two-spotted mite. The latter two are most prevalent on evergreens and other ornamental plants. Among the other good points of "Aramite" are its low cost and its compatibility with the



In the spring and fall Japanese beetle grubs do great harm to lawns by chewing the grass roots.

commonly used insecticides and fungicides. It is also non-hazardous to the person applying it and is harmless to mite-killing insects.

Fungicides

Captan (Orthocide 406) is perhaps the newest and most widely publicized of the disease-control chemicals. Among the diseases captan controls rather well are: apple scab, peach brown rot, cherry leaf spot, rose black spot, and brown patch of turf grasses.

Ferbam (trade names "Fermate" and "Karbam Black") is the best known of the newer fungicides belonging to the chemical group known as the dithiocarbamates. It controls scab and rust on apples, black rot of grapes and black spot of roses.

Maneb, a manganese-containing relative of ferbam, is excellent for preventing blights of potato, celery, and tomato, and leaf spots of hawthorn and certain fruit trees.

The zinc relative of ferbam, ziram, gives excellent control of leaf spots of iris and chrysanthemum as well as those on many vegetables. Zineb, another dithiocarbamate, is excellent for many fungus leaf spot and leaf blight diseases.

Mildew Control

The several fungicides mentioned above are not effective in combatting powdery mildew fungi. Sulfur sprays or dusts have long been recommended for these fungi but a newer, more effective material is now available. Its chemical name is dinitro capryl phenyl crotonate (trade names "Mildex" and "Karathane"). This material can be used after the mildew actually appears on the leaves, but most complete control is obtained when it is applied before the mildew becomes very prevalent, and when it is used periodically.

Antibiotics

The newest type of disease control materials are the so-called antibiotics. The first one to be made available to the general public was "Acti-Dione," which controls turf grass diseases such as melting-out, brown patch, and snow mold, as well as mint rust and leaf spot of cherry.

Streptomycin, or a mixture of streptomycin and "Terramycin," is another

(Continued on page 54)

Taking Advantage of Nature

By **Sallie F. Cole**

Five acres of tangled, undisturbed woodland on a hill overlooking Puget Sound, with the snow-covered Olympic Mountains as a backdrop—"What a place for a garden!" So we thought fifteen years ago when first we climbed over fallen logs to find a cleared spot large enough to lay out our lunch.

The years since then have brought changes to these woods, but we have tried always to keep as much of the untamed, natural look as is consistent with a restful garden picture. A few of the less desirable trees were cut down, and the tangled undergrowth cleared away by hand. As work progressed areas began to take natural shapes, separated one from the other by vegetation, so these areas were called "rooms." The rooms have no shapes in common, nor do they have any common number of walls — just divisions that came naturally.

In one case a giant fir had fallen many years ago and was laying north to south. At a later date another tree had fallen, west to east over the original tree. Both decaying logs were covered with a rich growth of *Gaultheria Shallon* (salal), making a south and west wall about five feet high in an area approximately twenty-five feet by fifty feet. In this space ferns were growing luxuriantly, as were nettles and blackberries. The latter two were cleared away and *Vancouveria hexandra* and *Trillium ovatum* planted in the vacant spaces, with *Oxalis oregana* as a groundcover. This spot has dainty beauty on a sunny summer afternoon.

Sambucus racemosa callicarpa (red elderberry) growing in a mass with *Holodiscus discolor* (ocean spray) acted as an enclosure for our "Fern Room." Our native sword ferns grow lush, some fronds three feet in length. To these ferns were added five groups of other native ferns. Port Orford cedars were used as a background, with *Dicentra formosa* (bleeding-heart) as a groundcover. A bird bath placed in the center of the area completed this composition.

The road and paths in the garden wind around through the trees, giving a sort of "just happened" look. The entrance road we call the "Hall." This extends from the south to the north boundary three hundred and twenty feet, with a pattern in sun, shadow, and then more sun. The planting areas on both sides vary from fifteen feet to fifty feet in width, as native vegetation dictated.

At the south end two Port Orford cedars close the view and at the north a towering Madrona tree *(Arbutus Menziesii)* creates the wall. The south entrance to the "Hall" is a sunny spot. Here on one side have been planted in quantity such sun lovers as floribunda roses, and 'Betty Prior' from June to frost gives a cheery welcome to all who visit "Colewood." On the other side are flowering trees, *Berberis Darwinii,* and several varieties of heather. There is also a planting of brooms in this area. The back wall of this bed are Madrona trees which volunteered in numbers, growing very close together. They are pruned to keep low growth and have made an attractive ten-foot high evergreen background.

Beyond the entrance rhododendrons and azaleas have been planted among the ferns, in the shade created by the tall Douglas-firs, hemlock, and dogwood.

Again in more sun the north end of the "Hall" is colorful much of the year with a large planting of pernettya and heather, growing happily near *Mahonia Aquifolium,* ferns, *Prunus demissa* (western chokecherry) and *Ribes sanguineum* (red-flowering currant) — all at the foot of a towering hemlock whose lower branches almost sweep the ground.

A narrow road and two trails to the west connect at various points with the "Hall" and enter an area where the fir trees create a green ceiling, approximately one hundred to one hundred and twenty-five feet above the woodland floor. These trees, growing in communities with open spaces between, create an interesting pattern of light and shadow on sunny days. In this area is a large planting of *Rhododendron macrophyllum* (our Washington native). These plants put on a beautiful

(Continued on page 43)

ORCHIDS ARE EASY!

By **Wellington F. Scott, Jr., and Carter Scott**

Mrs. Scott holds *Chysis bractescens,* which looks like a small corn plant with a bulbous stalk. The blossoms are white and appear to be carved from wax.

In The Garden Journal of July-August 1955, Ruth Marie Peters had a very interesting article on African violets. After reading the article and reflecting on our usual difficulty in keeping the beautiful little saintpaulias happy under average home conditions, it began to dawn on us how utterly easy it is to grow orchids under the same conditions. Of course, there are limitations. Certain orchids simply will not tolerate average household conditions. But if you are venturesome, and if you keep your initial investment small (so you will not continually be worrying about the possible demise of your plants), you can have a lot of fun with orchids with less care than saintpaulias require.

The belief that orchids are difficult to grow is one which dies hard. Perhaps this myth is kept alive, to some extent, by the very people who know how wrong it is. The general feeling that orchids are difficult reflects upon the grower of them an aura of importance which (let's admit it) is pleasant. Who would not beam with pride when amazed visitors say, "Do you mean you really grow them right here?" Sure, it's pleasant.

Our experiences with orchids began about three years ago. We thought they were difficult, too. So when a friend asked why we didn't join the Orchid Society of Greater St. Louis, we just gasped and said, "Oh, we have no place to grow them!" After all, our gardening interests are out-of-doors. In addition to the usual assortment of shrubs and perennials, we have a considerable collection of irises to care for and a wild flower area which requires a lot of loafing time.

And we couldn't contemplate a greenhouse, because we frequently are away from home during the winter.

But this friend persisted, so we attended a meeting of the orchid organization, just to close the matter. We returned home a bit unnerved. Those orchid people seemed to have no respect whatever for those delicate plants! They handled them with what seemed to us to be an unnecessarily rough fashion, picking up the plants by the leaves, feeling the texture of the blossoms with harsh fingers, and generally treating them like so many artificial flowers. And that demonstration of potting! It was alright up to a certain point, but when they started pounding osmunda fibre into the pots with a club, we thought they'd gone crazy. To cut the story short, we were so amazed by what we saw that we attended another meeting. At that one we listened to a recital of home growing methods by various members who did not have greenhouses. It was a critique on methods and results. A number of members had brought plants to the meeting to display either their success or their failure with certain systems of illumination and culture. Questions were asked and answered. There seemed to be no feeling that orchids were difficult to grow; rather an investigation into how much mistreatment they would withstand and still prosper. Finally, one member arose to explain her success with growing orchids in her basement coal-bin. This was too much! We had to try!

Fortunately, we sought the advice of George H. Pring, Superintendent of Missouri Botanical Garden, and in charge of orchid culture there. He suggested that we try a few cattleyas to begin with. We started with a cattleya 'Enid.' It grew and bloomed, not only to the amazement of our friends, but to our own amazement; for we realized only too well how little we knew about caring for it. Later we added others; a laelia-cattleya, a brasso-laelia-cattleya, an oncidium, a phalaenopsis, a dendrobium, a vanda, and a *Chysis bractescens* —a queer-looking thing from Mexico. Of these, the vanda is the least happy, and the phalaenopsis sometimes appears to consider the entire problem of survival not worth the effort. But the others just go merrily along, growing and blooming.

We must admit that the blossoms are smaller than they would be on greenhouse-grown plants, and usually fewer in number, too. If we get three blossoms on a spike of cattleya 'Enid' we consider it a good display, though we see plants from the same clone, in the greenhouses of our friends, with five to seven blossoms on a spike. But we have bloom for nearly a month, and are content with it.

How do we treat our plants? During the winter they hang in an east-facing window in a combination tool-room, potting-room, and office. At this season they get fed approximately every sixty days. The pots are taken down and dunked in a bucket of liquid plant food. We've tried several, including "Hyponex" and "Folium" in recommended strengths. They all seem to be satisfactory. After dunking, the plants are drained and then hung back in place. Watering is a sort of hit-and-miss proposition. The books on orchid culture are full of all sorts of rules on this subject, but we see those rules broken all the time by various friends, until we wonder if there *is* such a thing as a set of rules which will cover all climates. We think not. We water early in the day, when we "think" the plants need it. If the surface of a pot feels dry and room-temperature to the touch, if the osmunda feels dry when pressed, then the plant gets water. Otherwise, no. The vanda is an exception to this, for it is potted in a mixture of gravel and charcoal which drains quickly. The vanda gets watered much more often. Our house is heated by forced hot air which is very dry. The

plants seem to want watering frequently.

During the winter we never worry about too much sunlight. Conversely, there usually is not enough. So we use fluorescent lighting on dull days. Hung about a foot above the plants is a two-tube commercial fixture, with one "warm white" and one "daylight" tube. This combination gives a good coverage of the full spectrum.

As soon as the nights are dependably above 50°, we move the plants to a screened porch, where they are hung about a foot from the screening. The porch faces southeast, so that the plants get several hours of good sunlight each day. When orchid plants, particularly the cattleya hybrids, get too much sun, the leaves turn a yellowish shade of green. When they get too little sun, they become a dark rich green. It is best to keep them teetering on the edge of too much sun. We try to do this in the summer to make up for our mistreatment of the plants in the winter.

And that's all we do for them! If we leave home during the winter, we take the plants to some friend who has a greenhouse and "board" them out. If we leave home during the summer, we ask a neighbor to turn the garden hose on them every day or so, right through the screen. Nothing more. All summer they get a dousing with the hose each day. The textbooks will not say to do this, but we've observed that Missouri Botanical Garden does it, and they're a lot smarter about orchids than we are. So we figure it must be all right for conditions in St. Louis in the summer.

We do not feed the plants in the summer, and they do not seem to miss the feeding, for they make excellent growth during the time they are hung on the porch. We believe that one of the most important things in home orchid growing is good circulation of air around the plants. They seem to resent stagnant air, particularly if it is chilly. We believe that they will tolerate more improper treatment, if they have good air circulation than they would otherwise. Hang them if you can, and hang them where there is good air movement, or where you can create air movement.

There are a number of books on orchid culture, written by experts. The New York Botanical Garden's librarian undoubtedly can suggest several good titles. Some of them may still imply that orchids are difficult to grow, but pay no attention to that. You just go right ahead and grow orchids if you want to. They'll very likely not only live, but prosper.

These are not words of wisdom from people who know how. They are words to amuse the experts, written by people who certainly do not know how. We do grow a number of orchids with what we consider fair return in the way of growth and blossoms. We treat them in an unorthodox fashion; not because we are insensitive to their wants, but because either they must conform to our own living conditions, and prosper, or we must forego the pleasure of having them. Our experience proves, at least to us, that orchids are actually pretty tough customers. The varieties we grow do not need coddling, and they grow and bloom under conditions which certainly are not ideal. There are many orchids which would not survive under the conditions we offer our plants, but the orchid family is so tremendously diverse that there is no need to attempt the impossible.

Mrs. Scott waters a very healthy cattleya hybrid. Notice the trailing roots.

Most cattleyas and cattleya hybrids will do well under home conditions no worse than ours. Probably most cypripediums would not; nor would laelias, which are extremely sensitive to the industrial fumes of large cities. But *Dendrobium Phalaenopsis* and *Oncidium splendidum* do well, and *Chysis bractescens* does nicely. This last looks like a plant of some queer maize with swollen stalks, and the blossoms look as though carved from wax.

None of these are expensive, unless you go looking for scarce varieties of them. A small expenditure will return you many times the cost in the pleasure of watching the plant grow and the buds develop. To say nothing of the pleasure of having the lady of the household wears a nice blossom to some holiday function and remark casually, "Oh yes, we grow them."

You can, you know!

Mr. Scott inspects a *Dendrobium Phalaenopsis* which has just come into blossom. In the background may be seen a vanda, an *Oncidium splendidum*, several cattleyas and cattleya hybrids.
During the winter the plants hang in an east-facing window—just above them is a two-tube fluorescent fixture.

DRIED MATERIAL

Suggestions for Picking, Drying, and Arranging It

By **Beatrice P. Hendrix**

COLLECTING AND DRYING plant material of various kinds to arrange in winter when flowers are scarce and expensive is a fascinating and rewarding occupation. In fact, appropriate dried material, in combination with fresh flowers, fruit, and foliage, can be used to advantage at any time of the year and often adds character and a sculptured quality to home decorations as well as flower show arrangements. If any proof of its present popularity were needed, it could be attested easily by the fact that it has at last become "big business," for wholesalers are importing it from all parts of the world and retail florists, most of whom at first resisted the trend, are now making it a feature.

While it is pleasant to realize that so much that is rare and exotic, in addition to native material, is readily available, it is still more satisfactory, whenever possible, to start from scratch and pick one's own, as plenty of garden club people have been doing for years. A small group in the Hortulus Club of Greenwich, Connecticut, to which I belong, started in the early 1930's to experiment with seed pods, leaves, and even flowers to see how they could be dried and also whether or not they could be used attractively. As we progressed, we found that many members of other garden clubs were also keenly interested in the same subject. We exchanged ideas and pooled our knowledge with the result that before long dried arrangements began appearing in flower shows in such numbers that they had to be limited to special classes. There was a real danger that fresh plant material might become practically obsolete!

Now that this first great enthusiasm over a new discovery has settled down to normal, dried plant material has really come into its own. Flower arrangers everywhere realize that they are indebted to the pioneers whose findings have added so much beauty and variety to their store of lasting material.

Perhaps the most important piece of knowledge gained from all these early experiments is that, under the proper conditions, almost any kind of plant material can be dried. This does not necessarily mean that it is all beautiful, suitable, or even practical to use in arrangements, but a surprisingly large amount of it is!

While there are no general rules which can be blindly followed, there are three basic facts in connection with the drying of plant material which should always be kept in mind: first of all, the more substance the material has the more satisfactorily it will dry. By substance, I mean a fibrous or leathery quality. A perfect example is the foliage of the southern magnolia *(Magnolia grandiflora)*, a tough leaf of definite outline which changes very little in the drying process. On the other hand, soft leaves with a watery content, such as begonias have, dry very poorly, often rot before they dry, and if they do dry, shrivel away to practically nothing. The second elementary fact is that nearly anything will dry better if it is picked just before it has attained full maturity. Not only is there less shrinkage, less chance of disintegration, but more natural color is retained when material is slightly under rather than over or even fully developed. Leaves, however, must be nearly mature in order to have acquired their full substance, but not so old that they are ready to drop. The third general fact is a matter of the technique of drying—quick drying in a warm dry place away from the light is by far the best method.

Now, to be more specific. An attic or hayloft with beams overhead is ideal for drying if light can be shut out; but for city dwellers or those who have limited space, a part of a closet could serve the purpose. Straight stalks should be wired together in bunches and hung from the rafters (or a closet hook) upside down, but flowers like those of the leek, for instance, which tend to become entangled should each be hung separately. A table of some sort is necessary on which to place foliage or material which needs to be shaped while drying. One good way to do this is to press the material lightly between layers of newspaper, watching it carefully so that it does not dry flat, and encouraging curves and contours to give it a third dimensional quality by removing a few layers of paper every day or so. Another way is to pin or nail the material loosely to a board after shaping it to the desired curve.

Large leaves, such as lotus, which shut up like umbrellas if left to their own devices, can be controlled by placing them on a length of chicken wire stretched flat and taut, with their stems hanging through the holes in the wire. The edges of the leaves should be weighted with fine gravel to keep them from closing, although after a few days some of the gravel should be removed to allow about one quarter or even one half of the leaf to curl, thereby

Driftwood, apple branches, and rosette of mullen foliage arranged by Mrs. Erik A. Thomee for the exhibit "Lasting Beauty from Unexpected Sources" at The New York Botanical Garden.

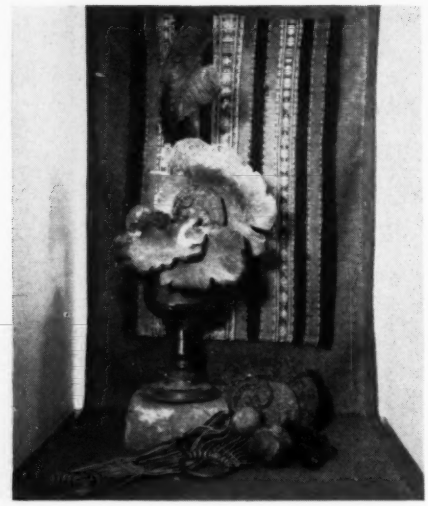
Arrangement by Mrs. Erik A. Thomee of anthurium flower, hydrangea blossoms, kitchingia leaves, and strelitzia in a pottery vase by Leon Volkmar; Japanese wooden figure by Kenzo. From the exhibit "Lasting Beauty from Unexpected Sources."

Arrangement by Mrs. Stafford Hendrix of tropical and semi-tropical material—liquidambar branch, dracaena leaves, bromeliad flower and foliage, sea-grape leaves, dombeya blossoms, knick-nut pods, and West Indian almond tree leaves. Pottery vase by Leon Volkmar; carved wooden llama by Manuel Velasquez. From the exhibit "Lasting Beauty from Unexpected Sources."

giving it a more natural and interesting appearance. Lotus leaves dried in this way should be handled gently for they are very brittle, but they keep their shape and their lovely green color for a long time. Another large leaf which may be treated in much the same manner, and which can add drama to almost any arrangement, is that of the cucumber magnolia *(Magnolia acuminata)*. When picked in late August or early September, it does not lose much of its natural color, green on the front and a soft gray on the back. Later in the fall it turns yellow and about the end of October when the leaves, already dry, have fallen onto the ground, they have changed to a deep reddish brown. It is then too late to change their shape but that is not necessary, since they have already taken on interesting curves.

Unfortunately, many delicate fresh flowers fade and shrivel when allowed to dry naturally. Some of them, however, can be preserved by burying them in powdered borax or sand. Among the best to dry by this method are daffodils, lilacs, delphinium, lily - of - the - valley, canterbury bells, foxgloves, cornflowers, marigolds, zinnias, pink dogwood, peonies, roses, and carnations. Here is the procedure: Cover the bottom of a wooden or strong cardboard box to the depth of three or four inches with borax or sand. If sand is used, it must be fine, dry, and sifted to remove lumps and impurities. Place round flowers, such as marigolds, upside down so that they do not touch each other. The stems should be stripped of their leaves and cut to a convenient length. If stems are weak and thin, they should be reinforced with wire, for otherwise, after drying, they will be so brittle that they will snap off. To wire a cornflower, for example, make a small hook at one end of the wire, push the other end through the center of the flower from the top until the hook is hidden and then wrap the wire around the stem. This will keep the flower and stem together and make it possible to wire the flower head to a false stem later, if that should be necessary. Spikey flowers like lily-of-the-valley should be made to stand upright by setting them on a needlepoint holder. After placing as many flowers as possible in one box without crowding them, cover them carefully and completely with borax or sand and store in a dark dry place for at least two weeks, which is about the average time for processing most flowers. Very delicate small flowers, however, require only a few days and are spoiled if left too long; while large heavy flowers, which contain a great deal of moisture often need as much as four or five weeks.

A successful method of preserving foliage such as beech, barberry, southern magnolia, ivy, dracaena, and aspidistra is to soak it in a mixture of one third glycerine and two thirds water. Woody stems should be split and crushed before



Fungus and exotic seed pods from South America in an antique bronze container. The stand is a stone block and the background an antique piece of woven material from Peru. Fungus, pomegranates, and strawberry popcorn are used as accessories with a colorful saddle-girth from Mexico. Arrangement by Mrs. Erik A. Thomee, Hortulus Club, Greenwich, Conn.

being placed in a jar of the solution which should cover stem ends for about five inches. Most leaves completely absorb the solution in about two weeks, but others with hard woody stems may need as much as four or five weeks. It is easy to tell how rapidly they are taking up the solution by watching the color of the leaves, for they become darker and usually change from green to brown. They remain soft and pliable after the glycerine treatment and have a smooth silky look. Although glycerine is expensive, the solution can be saved and used over and over again. Late summer is the best time to treat foliage in this way, as the leaves have no tendency to drop at that time and warm weather seems to facilitate absorption.

All material as soon as thoroughly dried or processed should be stored in heavy cardboard boxes, tightly covered, to protect it from light and humidity. Seed pods, grain, nuts, and fruits should be kept in tins; otherwise, they are sure to attract insects and rodents. I found once, to my chagrin, that a beautiful bunch of sorghum which I cherished had become a perfect breeding ground for moths! If dried material is kept where there is even a hint of dampness, it will be ruined by mildew.

Since dried material is sometimes hard to work with, because it is stiff and fragile, it is helpful to have plenty of different forms from which to choose. Making a design with it is almost like putting a picture puzzle together—all the parts have to fit. This should be kept in mind when picking or buying any kind of material so that stalks in different stages of development may be selected, also leaves that grow as "lefts" and "rights," natural curves and varied sizes. The unexpected always adds interest to an arrangement, and occasionally one runs across deformations which look strange and exotic. There is an abnormal widening and flattening of the stem called fasciation, which lends a novel appearance to the plants which it attacks. (According to what I have read in books on horticulture, although this condition is sometimes caused by disease, more often than not it is of unknown origin.) Over the years I have collected a number of fasciated stalks, including those of the wild four o'clock *(Oenothera biennis)*, the common mullen *(Verbascum Thapsus)*, and one which to me was completely unrecognizable, and which the experts at The New York Botanical Garden tell me is *Ailanthus*.

Arrangement of palm inflorescence and ginger palm pods by Mrs. Stafford Hendrix in a wooden buffalo bell from India on a Chinese red lacquer plaque. This arrangement was shown in the exhibit at The New York Botanical Garden and later, with the addition of the plaque, at the Fitchburg Art Museum.

Despite every effort to anticipate one's needs, there are times, when making an arrangement, that the material at hand does not conform to the design which one has in mind. It is sometimes possible to reshape the material by soaking it in water for several hours (in some cases, it may take several days), then molding or bending it into the desired form and redrying it near a hot radiator or even in a moderately heated oven. It stands to reason that this can be accomplished only with strong, resilient material, such as Scotch broom *(Cytisus scoparius)*, leaves such as bird-of-paradise *(Strelitzia Reginae)*, *Clusia*, or branches like bottle-brush *(Melaleca Leucadendra)* or mock-orange *(Poncirus trifoliata)*, to cite just a few examples.

Today everyone is looking for color in dried material. Cockscomb, *(Celosia argentea)*, which has been popular since Victorian times because its deep rich red hue lasts almost indefinitely, is often used to add a colorful accent to arrangements in neutral tones. It may also be obtained in chartreuse, yellow, beige, and a soft rose-pink, all of which varieties last equally well. Other good sources of red are California pepper berries, sumac, especially the lovely staghorn variety, beebalm, and pomegranates. Good yellows can be provided by tansy, yarrow, and acacia, while shades of reddish orange can be added by using butterfly-weed, rose hips, bitter-sweet and euonymus berries. Blues and lavenders are rather scarce but are to be found in globe-thistle, hydrangea, *Salvia farinacea*, artichoke flowers, liatris, and statice. There is a surprising amount of color, too, in the so-called

Coconut spathes, anthurium leaves, sea-grape leaves, and banana leaves with a sterculia pod as the focal point. The container is a wooden chalice on a mahogany stand. The arrangement by Mrs. Stafford Hendrix, Hortulus Club, Greenwich, Conn., was a demonstration at the International Flower Show.

neutral tones which range from off-white through all the tans, browns, and grays to black. With all these as foils for brighter hues, many different color schemes are possible.

It is not only important to have a good backlog of material when making dried arrangements, but it is also essential to have a few appropriate containers. They should never be in bright colors or have smooth, shiny surfaces. The soft tones of wood or unpolished metal or the dull glaze and variegated texture of hand-made pottery seem to enhance the subtle beauty of dried material. Natural containers are, perhaps, the best of all and collecting shells, rocks, fungi, and driftwood can be an absorbing interest in itself.

The actual technique of putting together a dried arrangement is somewhat different from working with fresh flowers. To offset the difficulties of using material, which sometimes seems stubborn and uncompromising, is the satisfaction derived from achieving a design which will last almost forever. But to accomplish it the proper mechanics are of primary importance. Vases may be filled with sand, gravel, or blocks of "Styrofoam" tailored to fit so that the stems, once inserted, will stay in place. When the arrangement is finally perfected, melted paraffin may be poured in to set it so that it can never move again. However, if this is to be done, the vase should have a liner which slips in and out so that the arrangement can be unset by dipping it in hot water when finally it has to be taken apart. For open containers I like to use mounds of clay which adhere to the bottom and hold stems firmly in place. Clay is also most helpful when using rocks or driftwood. There are several different brands of flower arranger's clay on the market, but the kind made for caulking or weather stripping and sold in hardware stores has a heavier consistency and a neutral color which is just right for holding heavy branches in place.

It would be possible to go on and on about what, how, and when to dry different types of material, and also where to procure it. There are all sorts of phases upon which I have not even touched, such as making pressed flower pictures and seed-pod compositions which resemble woodcarvings, decorating Christmas wreaths and swags with natural or gilded and silvered material,

The outer edge of the Christmas wreath is Oregon-holly, the inner edge eucalyptus pods; between is a row of burs from the sweet-gum tree *(Liquidambar Styraciflua)*. At the bottom is one pod of *Ipomoea*. The motif at the top is made of wisteria and lily pods with a section of a cone in the center. The wreath is finished with loops of henna-colored velvet ribbon for accent. Made by Mrs. Stafford Hendrix, Hortulus Club, Greenwich, Conn.

and all the wealth of material to be found in the tropics, but half the fun is discovering all these delights for one's self. If I have succeeded in inspiring anyone to go out and look for new material, to experiment with new methods, or to arrange dried material in a new manner, I shall feel that writing this brief summary of an intriguing and many-sided subject has been well worth while.

ADVANTAGE OF NATURE (from page 37)

display at the same time our native dogwood *(Cornus Nuttallii)* is in bloom. *Acer circinatum* (vine maple) adds a lighter touch to the planting. In winter its branches have an upward swirling pattern, which makes the trees look as though they were in motion. The vine maple also makes a real contribution to the fall scene with brilliant foliage. *Gaultheria Shallon* (salal) volunteers as a filler all over the garden and is particularly attractive as a companion to the vine maple.

In an open space, a sunny spot surrounded by shadow, is a planting of *Azalea occidentalis* (Oregon native). This azalea grows about four feet tall, and its beautiful pale pink bloom is very fragrant. We are aware of the perfume long before we arrive at the spot where it is growing. Pink Kurume azaleas and pink primroses have been planted as a complement to the Occidentalis azaleas.

When an area west of the house was cleared of its tangled growth of nettles, the soil was rich and porous—just the place for primroses. They have been tucked in among the ferns and *Mahonia nervosa* (Oregon-grape) extending in large drifts, where space permits, on both sides of a winding path. This is called the "Primrose Path." In the spring thousands of primroses and many large clumps of trilliums make a most colorful carpet in the woods. Last spring one clump of trilliums had twenty-six blossoms on stems more than a foot high.

The paths proceed west and all end at "The Circle," an open area where three *Sequoia gigantea* dominate the circle. They were planted as rooted cuttings thirteen years ago and now stand as beautiful specimens forty feet tall. In the circle are Mollis azaleas, and around the circle more rhododendron plantings—one all hybrids. Wide steps lead from the sequoias to a grassy picnic area where pine with ceanothus, manzanita, and kinnikinnick add their charm to this sunny area.

After fifteen years the garden now has an established look. In the beginning, after the native plants had been trimmed into shape and as many as possible preserved, many plants from far-off places were added. These are now living happily with our Northwest plants. If we can provide these guests with the soil and exposure they like, they soon adapt themeslves to our informal environment and lose all their restraint and grow as lush as their neighbors. The gardeners' problem in a garden of this kind is keeping growth under control. The saw and the pruners are the most important tools, but even above all tools must be a desire to give plants called "common" a chance to show their beauty.

As you walk through the garden from room to room, there is a feeling of informality, and yet of unity. Perhaps this feeling of unity comes from having disturbed so little of the native growth, and because the plants introduced into the garden have simply melted into place, as though nature had put them there.

What We Can Do About

THE INTRODUCTION OF PLANTS

By **John C. Wister**

Excerpts from an address prepared for the regional meeting of the American Association of Botanical Gardens and Arboretums at the National Shade Tree Conference, Santa Barbara, California, August 1955.

WHETHER we live in Maine or California, in cities, suburbs or farms, we are growing plants brought to us from many other parts of the world. Some of these plants came quite by chance, others were the result of systematic search. From the earliest prehistoric times the human race has been moving plants around the globe. Well-known examples are wheat, rye, and other grains. Centuries later the so-called medicinal plants were grown and taken from place to place, and then in the days of Greece and of the early Christian era an interest was taken in plants as ornaments. Box, yew, myrtle, and many other plants were grown and were taken from their Mediterranean homes to Great Britain. Botanists, indeed, have asserted that it is difficult to determine which species are natural to Great Britain, as so many plants were brought in by the Romans.

We have more knowledge, of course, of the introductions of more recent centuries—of the British and Continental explorers who came to this country to find new plants to send back to Europe. And we know a good deal about early explorations in China from the time the Portuguese found the orange and the French Jesuit Father d'Incarville brought us the ailanthus.

We know the plants brought by later Jesuit Fathers — David, Delavay, Fariges, and others. We know of the explorations encouraged by Kew. We are familiar with the famous explorers of the Royal Horticultural Society, Douglas, Fortune, and others, and of the twenty-two explorers sent out by the great British nursery firm of Veitch, including James Veitch, John Gould Veitch, Maries, and E. H. Wilson.

We come to the explorations undertaken from this country and the work of David Fairchild, Frank Meyer, N. E. Hansen, and E. H. Wilson, and the more recent men who have followed or are following in their footsteps.

It is present-day exploration and its possibilities that I particularly wish to emphasize. A respected botanical professor in one of our great universities has publicly stated that the day of exploration is over and that little more is to be found. He was referring, of course, to natural species. To those of us who grow plants, in distinction to those who merely look at them dried on papers in an herbarium, it would seem that the day of exploration was only just beginning, because there is so much more ahead that needs to be done and that never has been done, except in a very small way.

A few examples will illustrate what I mean by this. Most of you are familiar with the fact that Father David discovered and sent back to France *Buddleia Davidii* and that this turned out to be a very uninteresting plant. It was little grown and in a few years was dropped from cultivation. Fifteen or more years later, Wilson found the same species in China, but being a horticulturist as well as a botanist, he recognized that the plants he saw were slightly different from the plants that Father David had introduced, even though they undoubtedly belonged to the same species. Wilson sent back plants which were at the time given the status of wild botanical varieties. The three best were named *magnifica, superba,* and *Wilsonii.* Those three were so superior in garden effect that the plants immediately attracted great attention. They became popular very quickly. Some bright publicity man, realizing that the name *Buddleia* would not strike a popular chord, called it "butterfly bush." It was widely advertised. Plants were propagated by cuttings as easily as geraniums. Nurseries offered them at reasonable prices. In a few years they were sold in immense quantities all over this country.

Another example is found in our yellow tree peonies. Father Delavay found them first, and from them hybrids have been raised both in France and in this country. Many of the hybrids have the misfortune of hanging their heads, just as the parent plants sent from China had done. The flowers were hidden under the foliage. Then came Ludlow and Sheriff who, in their explorations on the border of Tibet, found a plant that they sent back under the name *lutea* Tibetan variety or Ludlow variety. Botanists are still arguing whether this is a new species, a new botanical variety, or just a new form. In any case, the reports coming from England say that it has larger flowers, stronger stems, and its flowers do not hang under the foliage. As far as I know, this plant has not yet bloomed in this country. Its value, of course, is something that will not be known for many years, but at least there is the possibility that a superior wild form has been given to us that may prove of great value to our gardens, not only for its good garden characteristics but as a parent of new hybrids to be made by plant breeders of the future.

There are to be found in our own great country, without going to China or elsewhere, innumerable forms of familiar species that are superior to the ones that we grow in our gardens. All it takes is some one with a keen eye to travel and search. This has been done by a number of people, and our gardens have been enriched by them. It has, however, not been done by enough people. One of the most important things that arboretums and botanical gardens can do is to organize expeditions to make systematic search for such superior forms.

To send expeditions to China is a very expensive matter. To explore near home does not cost nearly so much. It could, of course, be expensive if it were done on a wholesale scale as some day I hope it may be. It may, however, be done very cheaply by utilizing the services of professional botanists and of

professional horticulturists plus the many hundreds or thousands of skilled amateur gardeners who are fond of nature and who like to go off on summer trips. Many of them could be urged to keep their eyes open for some particularly fine plant.

This is now being done in the case of the western azalea through the efforts of the officials of the Tacoma (recently changed to Washington) Rhododendron Society. They have not only personally gone on hikes in the mountains, but have secured the cooperation of botanists in institutions in the states of Oregon and California. Some of these botanists have led trips of students to mountains near them, just for the purpose of picking up forms of this flower which seemed to them different from the ones ordinarily grown.

No one can say, of course, how successful they will be, but I have seen photographs of some of the plants brought in, which seemed to me to give great promise. What I, as an Easterner, have hoped the most, of course, has been that in the course of their travels, they would find certain plants which, although they might not be more spectacular in bloom, might prove to be more adaptable to the conditions of the East, where summers are hot and the rainfall sometimes scanty.

For gardens in our colder climates we need explorations as far north and at as high an altitude as the particular species in question will grow. Winter hardiness is not so important for California and the Pacific Northwest, but there similar explorations can be undertaken for forms of species that would adapt themselves better to their garden conditions than the forms of the same species they are now growing.

It is not even necessary to go out in the wild to search for new plants. Many fine plants practically unknown except to botanists can be found by visiting arboretums, botanical gardens, nurseries, and private gardens. Some arboretums have recognized fine new plants appearing spontaneously. Witness *Malus arnoldiana,* springing up in the Arnold Arboretum near the crabapple collection. A. F. den Boer, perhaps our greatest authority on crabapples, went from his own park in Des Moines to the neighboring town of Boone and, because he kept his eyes open, found a particularly fine form of the wild Iowa crab, which no one in the town of Boone had even noticed. He brought back cions, propagated it, and this crabapple will soon be in commerce under the name of 'Boone Park.'

There are plenty of interesting but nearly unknown plants in private gardens. A member of one of the Philadelphia garden clubs noticed in Wilmington, Delaware, a plant of *Calycanthus floridus* which had a fragrance quite different from the one in her own garden. She now has it growing in her garden. It has never been propagated commercially. It should be. I don't mean that it is a world-startling plant, but it is a charming plant and gives a fragrance different from the one usually found in old gardens.

There are many things that arboretums and botanical gardens can do to help plant introduction without any real expense to themselves. I know of a number of examples personally. Here are two that concerned Professor Sargent and E. H. Wilson. A Pennsylvania farmer, who had just returned from the Army in 1920, noticed in his woods that the native azaleas there were not all alike. He picked and pressed a couple which were different and more beautiful than the others and sent them to the Arnold Arboretum.

Professor Sargent explained to him to what species these azaleas belonged, urged him to be on the lookout for particularly good forms, and also to grow in his garden other azaleas and rhododendrons. Mr. Wilson arranged to send him seeds of species not ordinarily in commerce, and later on made it possible for him to get pollen from rhododendron growers in England. The result has been that this man, Joseph Gable of Stewartstown, Pennsylvania, with no botanical training, no horticultural experience beyond his general farm and orchard knowledge, a year or two ago received in recognition of his fine breeding work the gold medal of the American Rhododendron Society.

This story was almost repeated a little later in the case of C. O. Dexter of Sandwich, Massachusetts. He became interested in the good selection of rhododendrons and azaleas a landscape architect had planted for him, and wanted additional species. Professor Sargent and Mr. Wilson enabled him to get them. Mr. Dexter took up breeding on a large scale, grew about ten thousand seedlings a year during the last twenty years of his life. He kept no records and his plants usually are not marked. After his death, there remained scattered collections of them in the gardens of people to whom he had given or sold unbloomed seedlings. A group of men from the American Rhododendron Society has been trying to find which are the best of the many thousands of seedlings they have examined in a score of gardens in the East. If they can do that, they will perform a great service for eastern rhododendron growers. Among the institutions represented in this small group are the Arnold Arboretum, the National Arboretum, Cornell University, the Scott Foundation at Swarthmore.

Could not literally dozens of amateurs be found who might do similar work in the next quarter century, if they had the encouragement of our Association?

Our great nurseries no longer grow the great collections of plants that they did a quarter of a century ago. Economic conditions, the high cost of labor particularly, and the almost impossibility of getting good labor that is interested in plants, have forced them to cut down on the items they grow and to grow instead larger quantities of fewer kinds. This is a severe blow to American horticulture. No one can blame these nurseries. Fortunately to fill the gap, many amateurs have gone into business on a small scale on some particular plant, such as iris, daffodils, peonies, hemerocallis, gladiolus, dahlias, chrysanthemums, African violets, and other relatively small plants that fit in the backyard. Our greatest advances are now coming from such men. Can not these backyard specialists become associate members of our Association in order to keep in closer touch with the work of arboretums and botanical gardens and learn what plants or what pollens are to be had of the rarer kinds not ordinarily seen in nurseries, which they might advantageously use in their breeding?

No one arboretum or botanical garden can do this alone. Through the American Association of Botanical Gardens and Arboretums, however, we can encourage all institutions to help amateurs whether nearby or at a distance.

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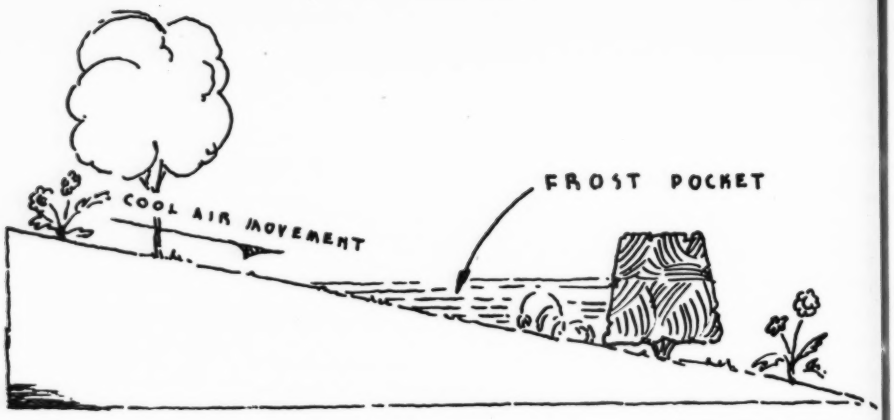
TEMPERING THE ELEMENTS WITH PLANTS

By C. W. Cares



MARK TWAIN once said that everyone talks about the weather, but no one ever does anything about it. Long before the days of Mark Twain man has been engineering changes, usually unintentional, in his local weather by his activities. Man the farmer, the engineer, the architect has effected clear measurable differences in his physical environment. In the twentieth century man's influence on local weather, due to his greater industrial activity and numbers, has become of prime importance to his health and economic security. The dust storms in the Middle West are the results of his mismanagement of agricultural land. The noxious smog blankets which smother several cities are the result of placing industrial activities in highly concentrated density with unfortunate disregard of local meteorological conditions.

Historically we find that primitive peoples were often skillful site planners. Those who were not were either wretched or did not survive. The recognition and exploitation of favorable orientation was and is a matter of survival for other creatures more primitive than man.

Certain species of insects, for instance, are notable for the way in which they locate their dwellings with respect to the sun or protective shelter. Certain insects adapt their dwellings to make the most of favorable insulation or protect their broods from excessive temperature or cold. Anyone who has thoughtfully investigated nature can list dozens of instances when primitive animals use local climatic variations to improve their conditions.

Though humans have, to any great extent, only recently made a serious study of the microclimate, we know that for ages man has used the devices and site planning principles which we seem to be rediscovering. Solar orientation is not new. However, by organizing and analyzing the meteorolgical data available, scientists have been able to point out many refinements which can help us be comfortable in the face of adverse temperature extremes.

Windbreaks in the form of broad high hedges have been used extensively in the prairie states as well as in other plain regions of the world, such as the North Sea coast of Germany and Denmark and in Russia. The effect of a windbreak hedge extends not only downwind but to a smaller degree in the direction from which the wind is blowing. An estimate of the efficiency of a windbreak is that it offers protection in a direction against the wind of from five to eight times the hedge's height. It will protect a distance of from twenty-five to thirty-five times the height of the hedge on the lee side. These figures are taken from measurements of M. Woelfle in Germany and W. Nageli in Switzerland, as quoted by Geiger in *Climate Near the Ground*. A hedge of mixed deciduous and evergreen plants seems to be the best. A complete wall is not as efficient as a hedge which allows the wind to filter through in spots, because of eddies and currents which develop with the solid hedge. Since the width of the protected area is a function of the hedge height, the choice of species will vary with the need for height, rate of growth, and adaptability to the ecological conditions. Hedges of this type mitigate wind velocity to protect dwellings and farmsteads as well as crops. When soil is especially dry, the benefits in preventing soil erosion are particularly apparent.

While there are slight measurable differences between air temperature under the shade of a tree and in full sunlight, the psychological difference is greater. We know that on a hot sunny day we feel more comfortable in the shade than in the sun. By placing a shade tree or trees with respect to an outdoor sitting area and the path of the sun, we can plan shade for the hours of use.

The altitude, the vertical angular difference between the horizon and the sun, changes throughout the course of each day and each day with respect to the next at a given time. The azimuth, the horizontal angle between the position of the sun and true north, also shifts in the same way. Values for altitude and azimuth will, of course, vary with the latitude. To shade areas effectively a complete understanding of these principles must be held. As elementary as this may seem, houses are placed with respect to existing trees with no thought given to the use of the shade. Trees are planted with a view towards providing shade for a given area only to discover that the shade falls in the right place but at the wrong time for the use intended.

Deciduous trees are just as effective in providing summer shade as evergreens but have the added advantage of losing their leaves in winter, thereby allowing the sun rays to penetrate into the house or paved area in winter when the extra heat and cheer are welcome. Deciduous vines on treillage over windows are useful for the same reason.

In the late afternoon in summer, the sun is so low in the sky that the rays hit western walls approaching a perpendicular angle. This causes the house to absorb several times more heat than the south walls receive when the sun is high in the sky. Rooms with windows on the west will heat up terrifically in

the face of these low rays. Tall-growing shrubs can be chosen to protect the west wall, when the sun would shine under the branches of a tall-growing tree.

Vines and treillage are also effective in blocking this heat.

Plants have the advantage also of acting as partial sound barriers. They filter dust from the air as, for instance, when they separate a dirt road from a residence. They act as visual barriers to block out objectionable subjects from the beholder's sight. Groundcovers also contribute to one's physical comfort by eliminating glare. For this reason a planting of a low shrub or groundcover outward from a low window will decrease the amount of eye tiring reflection which an unshaded paved terrace would permit.

We find ecological conditions suitable for plants with specific requirements, in islands, separated from the normal population. This is possible because of microclimatic conditions which reproduce the normal habitat. In our gardens we can create situations favorable for the culture of many plants which are entirely out of their normal ecological range. Often the situation is already present, but unrecognized. Perhaps a plant which would not survive in ninety other sites would, because of either an artificial or natural microclimate situation, be entirely hardy in this one spot.

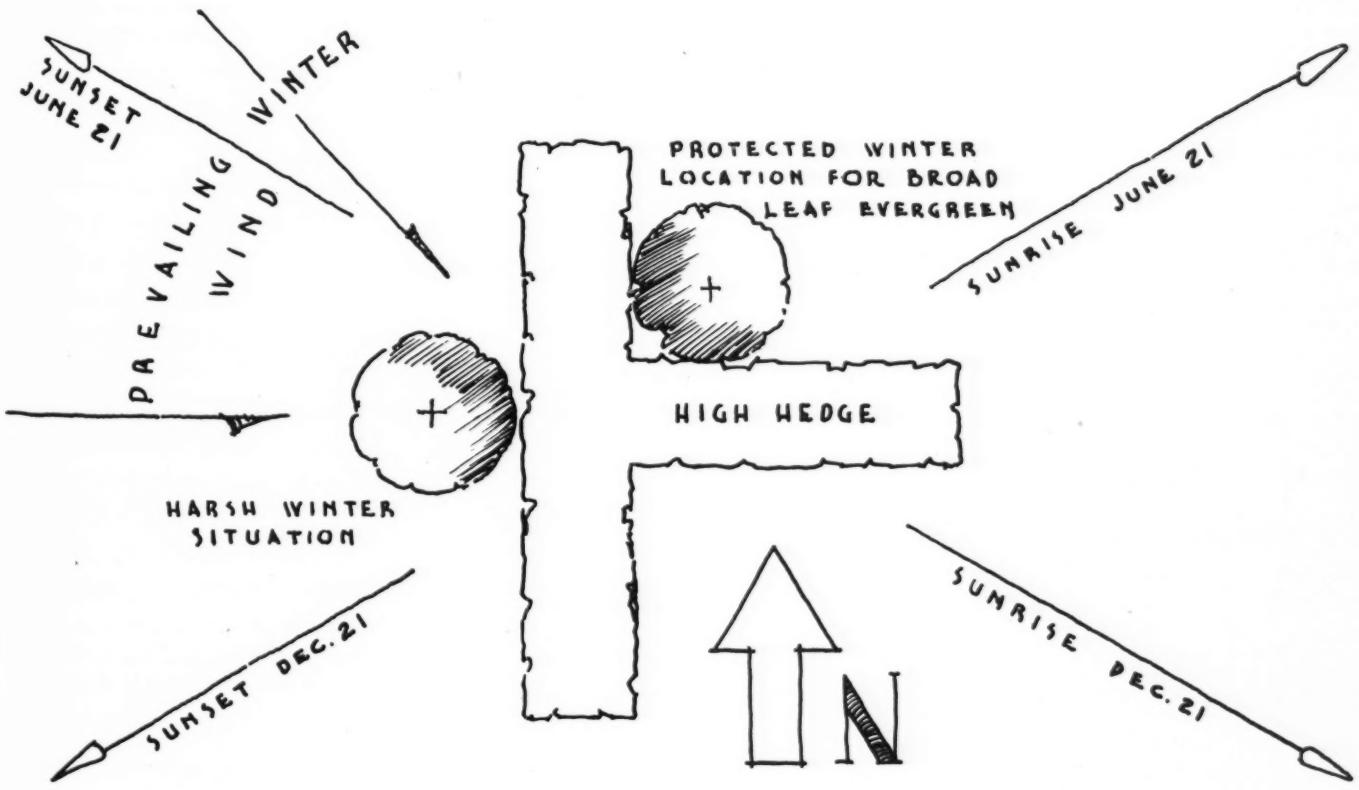
Ithaca, New York, is well north of the normal hardiness range of such plants as *Ilex Aquifolium* (English holly), *Prunus Laurocerasus* (cherry-laurel), *Albizzia Julibrissin, Skimmia japonica,* or *Sarcococca Hookeriana,* yet these plants may all be found growing in Ithaca. To be sure, they are curiosities and are not suitable for general landscape use; yet they are all thriving in protected locations in this upstate New York town.

Buxus sempervirens is not listed as being hardy in Ithaca either; yet handsome plants have been growing for years, where they are shaded from late winter sun and protected from the drying effect of March winds. The use of hedges and windbreaks to diminish the force of winter winds was discussed. Hedges also act as snow catches, dumping the snow to the leeward of the hedge. This extra snow mulch is protection against growth starting too early in the spring, and it also minimizes the alternate freezing and thawing which causes the death of shrubs and perennials which would be able to withstand sustained low temperatures.

Injury caused by drying is sometimes mistaken for low temperature injury where broad-leaved evergreens are concerned. Broad-leaved evergreens planted on the north side of a hedge or building are protected from the sun, which thaws out branches and causes transpiration to begin with resultant water loss. When the soil remains frozen but the top is frost free, the water lost through transpiration cannot be replaced from the frozen soil and leaf injury due to drying is the result.

Another area of plant response to microclimatic phenomena is with respect to air drainage. The movement of cold air down hill into so-called frost pockets is well understood. It is a matter of experience that plants on a slope sometimes remain undamaged by frost, when those of the same species at the bottom of the hill in the frost pocket are killed. A hedge clothed with foliage down to the ground when placed perpendicular to the direction of the slope will create an artificial frost pocket above the hedge. A hedge in this position may also protect plants placed downhill from it from light frosts. A gap in the planting or a choice of plants with bare lower stems to allow the cold air to continue movement down slope

(Continued on page 55)



Planting for Climate Control

By **Nelva M. Weber**

EVERY HOUSE AND GARDEN, however small, has more than one climate. There is a world of difference between the sheltered angle in the southeast ell of the house and the cold, shady, windy northwest corner. Some of these small climates are a result of the house and its location; others are inherent in the original topography of the land itself.

Little can be done about changing the house and its location on the land, and only a limited amount of changes can be made in the topography of the small property; but by careful choice of plants and intelligent placement, existing climates may be altered and, in a sense, new ones created.

Almost everything that man does to the land makes it less comfortable as a place to live. The soil under its mulch of leaves on the oak forest floor does not get very cold in winter nor very hot in summer. But let the trees be cut down, the ridges bulldozed, the swamps filled, and a "development" installed, complete with streets, driveways, and ranch houses, and the mild climate of the oak forest becomes a man-made climate not unlike the desert—hot in summer, cold in winter.

People are uncomfortable in summer because of high temperature, high humidity, not enough wind. Careful planting cannot work miracles, but it can help make summer more bearable.

Abundant sunshine is a very vital part of our climate. It makes for happier and healthier people and gardens, and fortunate indeed is the home owner whose house and land receive a bountiful share of it. However, summer sun brings high temperatures, and to be comfortable some means of controlling it is necessary. Simplest of these is some form of shade.

A deciduous trees is nature's automatic sunshade. In winter when sunshine is welcome, the tree is conveniently bare; as the spring approaches, tiny leaves unfurl and with the arrival of summer, this leafy screen is operating at top efficiency as a sun control and an air conditioning unit. Not only does it cast shade as an awning would, but it cools by radiant cooling as gallons of water evaporate from its leaves each day. On a summer's day the leaves of a tree may be only a few degrees warmer than the surrounding air—say 80°; paper leaves of a similar size and color would have a temperature of 130° the house walls would be 130°, the roof 140°, and the asphalt drive 160°. All of which is very good reason for choosing a tree as the feature of a summer outdoor living area.

Fortunately more and more modern houses are designed with large south windows which flood the rooms with winter sun, while an adequate roof overhand completely shuts out the summer sun. Such a handy program of sunlight is possible because the noonday sun in midsummer is approximately 60° above the horizon, while in midwinter it is a mere 30° above the horizon. For houses with insufficient roof overhang or for two-story houses, a deciduous tree can be used as a summer sunshade for the windows and the terrace as well. Or install a narrow eyebrow of lath, wire or pipe, extending out over the top of the window and festoon this support with a deciduous vine which clothes itself with foliage in summer, but is conveniently bare in time to let in the winter sun.

Keeping sun out of the house in summer is only one part of the "keep cool" program. Sun shining on the house walls heats them to high temperatures, and this heat is passed into the interior. Again, the answer is shade, preferably one or two deciduous trees of medium size. For a house facing south, with a south terrace, place the tree on the southwest corner of the terrace, approximately ten feet from the house. In the early morning when sun is not objectionable, this tree will cast no shade on the house; by late morning and through early afternoon, it will shade some of the roof and part of the south wall. By mid-afternoon the shade will cover a large portion of the roof, the terrace, and a sizeable part of the south wall. In late afternoon the south wall and terrace will be shaded by the house itself. (See Fig. 1.)

An unshaded paved terrace on the south side of the house is a liability rather than an asset in summer. Dark

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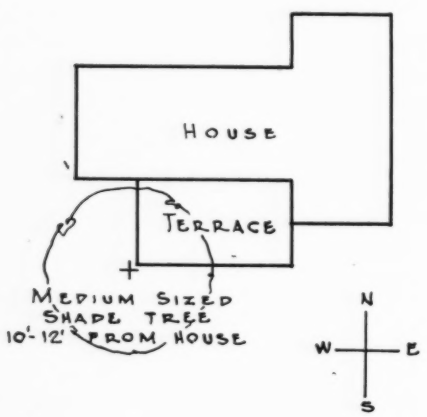

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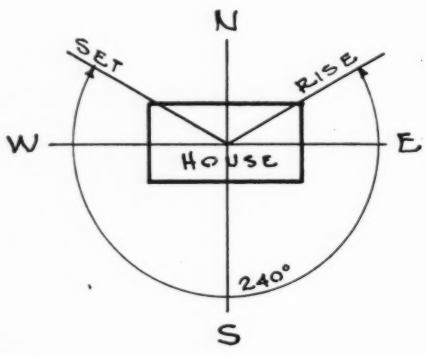

SUMMER

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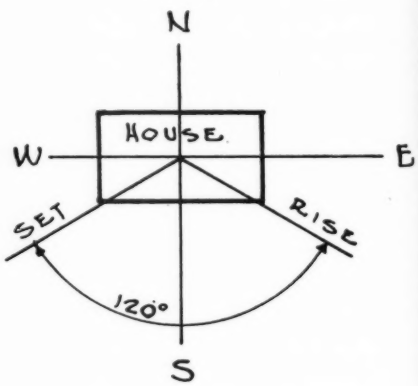
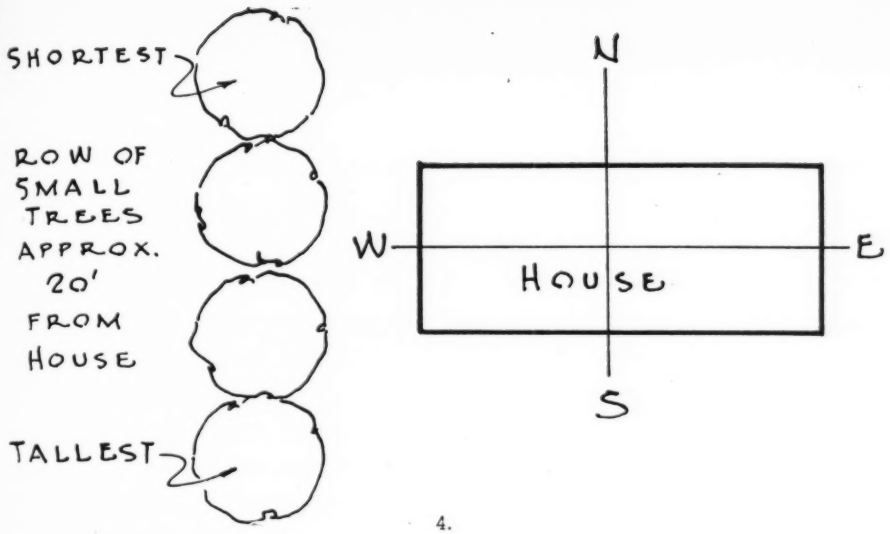


WINTER



4.

paving stones absorb heat and give it off in the same manner as an old-fashioned cook stove. Light colored stones reflect some of the sun's heat but make the house very glary. The remedy for both is shade, especially afternoon shade, preferably from a deciduous tree.

In the absence of a tree, mass planting on the south side of the house will have a cooling effect, since it drinks in the sun, yet does not heat up as stone or wood does. Plants are also the coolest kind of groundcover. Paving stones absorb about 70° of the sun's heat, while grass absorbs only 5°. Even a narrow strip of grass or groundcover in front of the house will help. A farmer once said, "God couldn't have chosen a prettier color for the landscape." It happens that green is not only prettier but also cooler, both practically and psychologically.

Contrary to popular opinion, it is the west and not the south side of the house which is hottest in summer. Soon after noon the west side of the house starts getting sun and by four o'clock the sun is in the west; the south wall is then in shade and begins to cool off. As air temperatures climb, the afternoon sun strikes the west wall squarely. By late afternoon the summer sun will shine on the north wall of the house and will also heat it, unless shade is provided.

The problem of keeping summer sun from shining in the south windows is easily solved by proper overhang or an eyebrow; but these devices cannot protect west or northwest windows because of the low angle at which the sun enters. A tall vertical screen west and northwest of the house and at some distance from it is the solution. This might be a series of baffles made of sections of fencing or clipped hedge, a trellis with deciduous vines or a row of small flowering trees across the west side of the house and extending beyond both corners. Such a scheme not only keeps low afternoon sun from shining into the windows, but more important, it shades the west and north walls and hence keeps them from heating up excessively. The tree on the southwest corner may be twenty feet from the house, and it should be the tallest in the group; the tree off the northwest corner could be shorter to take into account the lowered angle of the setting sun. (See Figs. 2, 3, 4.) Masonry walls would profit further by a green covering of vines, and here again it is the west wall that profits most. Even without west or northwest windows, these walls should be shaded for maximum comfort.

In many places heat is made even more unbearable by glare, and the whitish hazy summer sky is a major offender. Glare outdoors is improved in the same manner as glare indoors—by indirect lighting. Introduce indirect light from trees, shrub borders, lawns. Show the eye less sky and more earth. Lengthen the low part of the landscape while masking out as much sky as possible. Trees are important here, too. Nearby trees shut out much of the sky but do not block the low or the long view. Avoid small trees near windows; they let in the sky view but hide the cooling lawns.

Besides shade, wind and water play a part in making the heat of summer less oppressive. An avenue of trees which is parallel to the prevailing summer winds help to channel and amplify the breeze. Beware, however, of blocking up the end of the avenue or the effect will be lost. The prevailing summer breeze is from the southwest. A house on a south or southwest slope with no heavy planting to interrupt the air flow is fortunate. A band of planting off the southeast corner of the house and some distance away would

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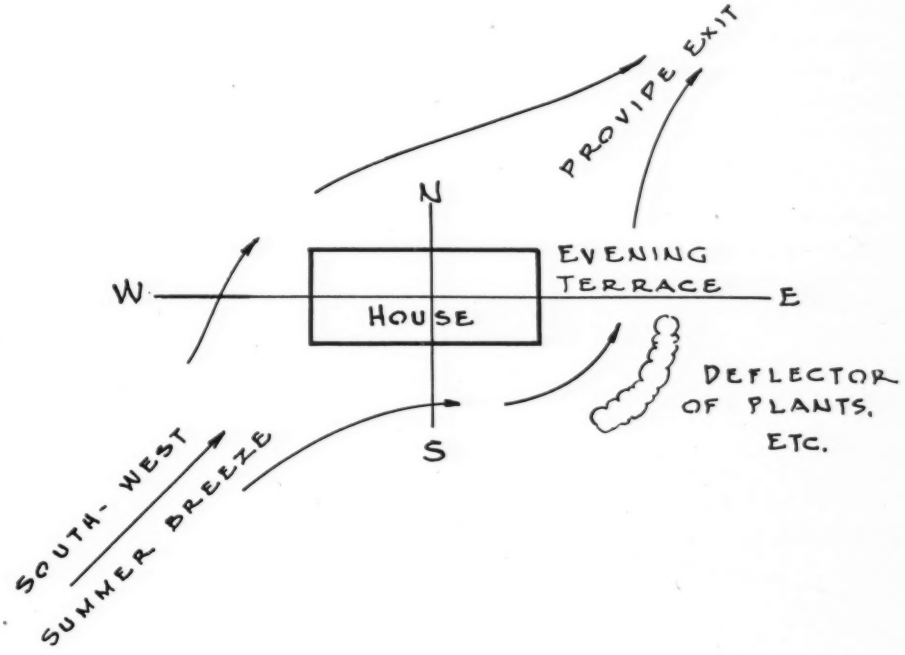

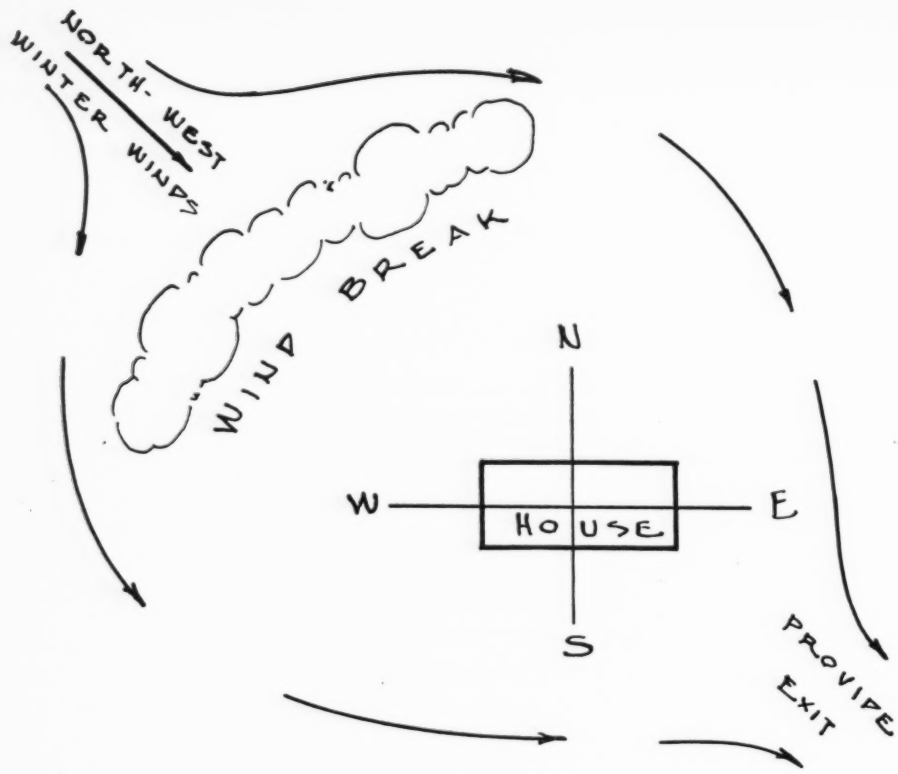

6.

help to channel the breeze and make a cool east terrace. Be sure to provide an air exit, perhaps to the northeast or a gentle breeze will die "abornin." (See Fig. 5.)

Cool air flows slowly downhill like water, or to be more exact, like honey. A slope no greater than one foot in one hundred is enough to insure this movement of air. If this cool air can be collected and contained at a low point on the property, it makes a delightful evening sitting area. A pool of water will further add to the coolness. A wall, tight fence, or evergreen hedge can form the low side of this area, but shrubs and low hedges which block the air flow from above should be removed. (See Fig. 6.)

By the same token this cool sitting area will be a "frost pocket" in spring and fall. To prevent this, install a gate in the fence or hedge. When frost threatens, the gate can be opened so the cold air can continue to flow on to a lower level.

Gardens in general should be located on south or southeast slopes and at high rather than a low point on the property. A wall or evergreen hedge at the upper end of the garden will prevent cold frosty air from flowing into it from above. Since this current of cold air is often no more than two or three inches deep, the obstruction need be only a foot in height.

Low temperatures and strong winds make for winter discomfort, and in this season also plants, correctly placed, can help.

Walls that were shaded against summer sun by deciduous plants are now bathed in winter sunshine, while sunlight streams through the south windows. If such areas are protected from the wind, they are also useful sitting areas in fall, winter, and spring.

Anything that can be done to reduce winter wind velocity will make a house more comfortable and a garden less subject to winter damage. It takes more fuel to heat a house when the temperature is 32° and the wind twelve miles per hour than when the temperature is 0° and the wind three miles per hour. Thick hedges or rows of evergreens can deflect the northwest winter wind around the house. Curved wind deflectors work better than straight ones which the wind hits head-on. Here, too, it is important to leave some place for the wind to go; don't dam up the flow. (See Fig. 7.)

Planting is a better windbreak than a fence or wall which throws the air into a mass of swirling eddies. Trees slow down the wind gradually and pass some of it through. Groves of trees to the windward give a protected area behind it equal to twenty-five to thirty-five times its height and deciduous as well as evergreen plants make valuable windbreaks. Maximum wind protection is assured with a series of windbreaks rather than a single row of plants, as each one acts like a baffle and the air is eventually brought to a standstill.

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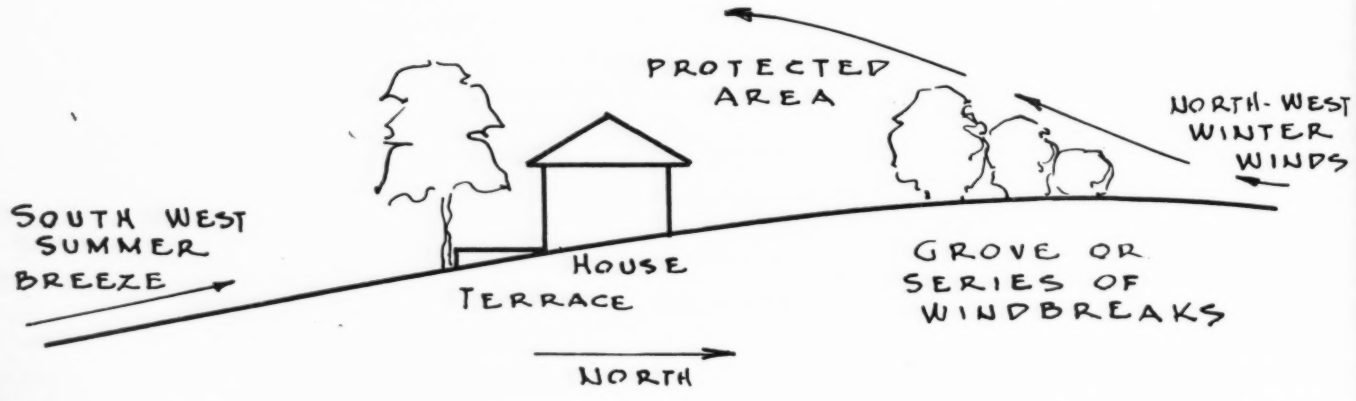


FROM MUD TO MARIGOLDS

Know How To Do It

By **A. C. Pfander**

THERE IS STILL TIME for the final touches on the landscape plan during the inclement periods of March. However, be ready for breaks in the weather to do as much of the preparatory work as possible. Areas to be planted should be spaded any time when the soil has lost that sticky, muddy character.

The landscape plan in this article is to be considered only as a general illustration. Landscaping the home property should be done with some basic ideas in mind. Items marked #1 on the plan are basic and should be given attention first. However, it is perfectly okay if only the entrance is planted permanently the first year. Keep adding a permanent plant whenever possible.

You will notice that there is a free space close to the house; this is for cleaning windows, painting, etc. When plants are too near to the building, you have to work over and through your plantings with constant damage to the plants.

Plants around the entrance and at the corners of the residence make the backbone of the design and must be selected with care. A studied entrance will give character to the entire front of the dwelling and can be achieved in many ways.

The important architectural features of the house should be considered. If the entrance, or the corners, appear low, it may be desirable to give the impression of height with plants of a tall, slim nature. If the opposite is true, a lower growing type of plant material may be used for best effect.

Well-placed evergreens will give great satisfaction over the entire year, provided they are of a slow-growing habit and spaced with plenty of growing room so that natural development is assured.

Japanese yews can be used to great advantage—they are without question the royal family of evergreens. Yews are available in slim, upright as well as low-growing, spreading varieties. There are, however, many other plants which can be used with excellent results. Mountain-laurel, andromeda, some of the evergreen azaleas are all very fine, and if the entrance is shaded part of the day rhododendrons may be used to advantage. These broad-leaved evergreens will also have the added virtue of a good flowering period.

Abelia grandiflora and the firethorn are evergreen for part of the winter. They are both lovely plants. The abelia, which has fine bronze foliage, flowers all summer to frost; the firethorn has clusters of bright orange berries in fall.

Where possible or desirable, wisteria or a similar climber may be trained on wall hooks over the entrance or windows for further embellishment.

The plant material available for all these different uses is so great that it could not possibly be listed in the confines of an article of this kind.

We learn most quickly by horrible examples. Take a slow ride through any section which was built about twenty years ago and look at the number of houses where the windows, the porch, or sometimes the entire structure is hidden by a profuse growth of hemlocks, pines, arborvitae, or spruce —so much so that you can see neither into nor out of the residence. In many cases, the plants around the entrance are planted too close so that they are crowding the entrance. This kind of landscaping is the least satisfactory. You will also see some very well planted home grounds, and here you can benefit greatly by observation and a bit of study.

You will note that often the so-called foundation planting is too dense —a better planting could be achieved with fewer plants; also, that the plants are too near the wall and have suffered.

Sometimes it is possible to speak with the owner of the property. Don't hesitate to compliment him. Invariably he will open up like a morning-glory and tell you all he knows. Ninety-nine out of a hundred gardeners are friendly and eager to tell of their experiences.

Always determine the ultimate use of your plants and then give your information, as complete as possible, to the nurseryman. In turn he will show you the plants adapted for your purpose, and from them you make your selection. Many nurseries make landscape plans without charge for their clients, with the condition of patronizing them for the plants.

Ask questions of your nurseryman. What are the growth habits of this plant? How tall will it be at maturity? How much space will it take? Can it be kept in check without butchering? Is it suited for such a position? Don't hesitate to say that the budget is tight —nurserymen know from bitter experience what that means. Start with small plants, they will soon grow up.

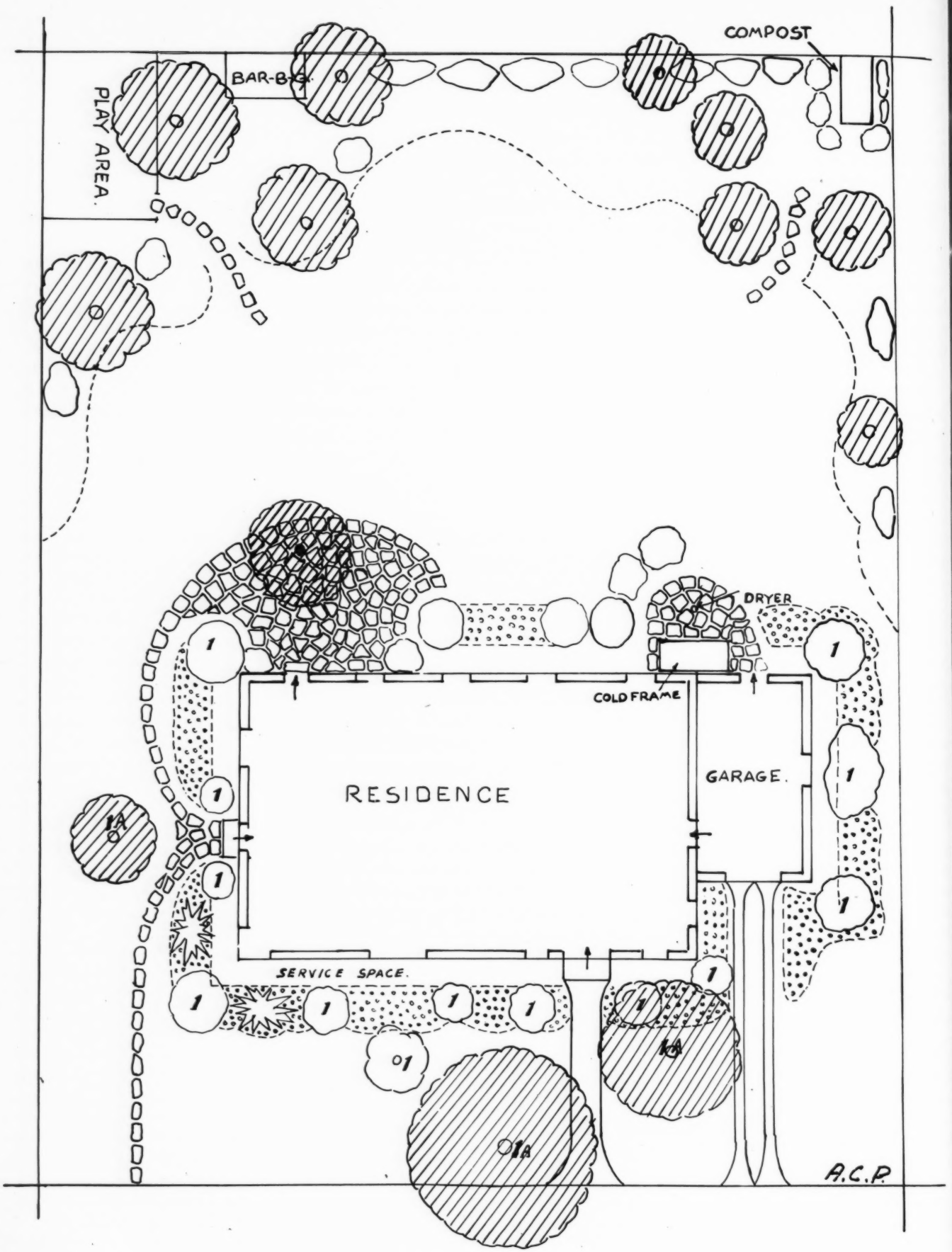
As a broad rule, shade trees for the small or moderate-sized property should be of moderate size. A medium-size shade tree can give as much comfort as a large one and does not constitute a danger during stormy periods, nor will it become overpowering in proportion to the house after a period of years.

The dotted areas in the plan are to be planted in summer annuals from your coldframe and such permanent plants as you may acquire from time to time.

It is now time to get the coldframe ready for seeds. Dig it over, break up the soil, level carefully, and cover with at least three inches of screened soil. If the soil is heavy, add some sand at least into the top six inches to make the soil crumbly.

Buy seeds of annuals of the kind you like best—directions for seeding are on each package. Follow these directions carefully, note the right time for seeding and you are on your way.

During inclement and rainy days keep the sash on the frame. Raise the sash a bit on sunny days, otherwise the inside of the coldframe gets too hot.


COMPOST
BAR-B-Q.
PLAY AREA.
DRYER
COLD FRAME
RESIDENCE
GARAGE.
SERVICE SPACE.
A.C.P.

Use a fine sprinkler when watering, and don't let the soil get dry. After a short time you'll find that these little tasks take only minutes to do—after all, it's just a matter of common sense. The reward is surprising.

The landscape plan also shows a terrace made of flagstones laid directly in the soil. All flags should be laid with great care on soft soil with pebbles carefully removed, and each flagstone must be tested so that it does not rock when stepped on. Flags must be flush with the ground to permit a lawn mower to roll over them smoothly. Careless work on flags will mean a constant source of annoyance — and something to trip over.

The size of the play area for children will have to be determined by individual requirements, but the area should be fenced at least along the sides toward the garden for obvious reasons.

The outline for the back planting area is approximate and should be as your ambition or personal taste dictates. An informal outline, as a rule, is more interesting.

The back area should be treated for maximum privacy and should include evergreen and flowering shrubs. For background, the use of shade trees is indicated, but the family's preference should be considered and also the kind of garden planned. Again, the great fault is to overplant.

For those interested in a barbecue, we have two good fireplaces at the Garden and anyone may inspect them.

Join a garden club in your locality and attend the meetings—you will be surprised how much information and help you will get. Come to The New York Botanical Garden for ideas and information—in a very short time you will find that the pegs fall into the proper places.

Don't hesitate to call me at the Garden (LUdlow 4-8500), or drop in to see me to talk over your problems. You will always be welcome, and I shall help in every way possible. Good Luck!

In successive articles, we shall go into detail on suitable plant material and different gardens to meet individual requirements.

Know What to Do

March-April—

With the coming of spring, there's the urge for better lawns, bigger and better gardens—but do curb your enthusiasm at least to some extent. A small well-kept garden gives much more pleasure than a large one which you cannot care for properly. You do not want to feel that you must spend all your week-ends working in your garden from dawn till dusk—you want time to relax—to sit back and enjoy the results of your gardening efforts.

As the weather permits, remove winter covering from shrubs, roses, perennials.

The next thing to which you should give attention is your lawn — in fact, the lawn tops the list of jobs to be done in spring. No matter how attractively your place has been landscaped, its appearance is marred when the lawn is in poor condition.

Feeding with a good fertilizer (5-10-5 or one with a slightly higher nitrogen content) is the first step toward a beautiful lawn. The fertilizer should be applied before any growth starts; this reduces the chance of burning the grass. Grass can be burned very quickly if the fertilizer is applied too heavily after soft growth has started. A fertilizer spreader is a great help—it distributes the food evenly and cuts down the time it takes to fertilize the lawn.

If your lawn appears to be in fairly good condition, no re-seeding is necessary. But any weak areas should be reseeded as early as possible. First rake to remove dead grass and to loosen the surface soil enough to prepare it for reseeding. After you have sown the seed —and remember the best grass seed is the cheapest in the long run—apply a light top dressing (two parts of clean soil and one part of humus thoroughly mixed) and then run a light roller over the area to complete the task.

In localities where Japanese or Asiatic beetles are troublesome, lawns are often damaged by the beetle grubs which feed on the grass roots. Ground moles are also a nuisance in lawns. Both these pests can be controlled by an application of lead arsenate (ten pounds per one thousand square feet) well watered on the ground. Caution! Do not apply lead arsenate at seeding time. Lead arsenate declares an extra dividend by helping to check crabgrass. It should be applied as soon as the frost is out of the ground and followed by the spring feeding of the lawn. Some garden supply houses can supply grub-proof materials already mixed with fertilizers; two or three applications of such materials are usually required for satisfactory results.

With your lawn work out of the way, you should be free to begin on the perennial borders or beds. These should be thoroughly cleaned up; and any plants which have overgrown their allotted space should be thinned out and divided. When dividing plants, it is better to discard the centers of the clumps and replant the outside portions. A digging fork is the best tool for this operation. Be careful, when dividing phlox, to use only parts of the original plant; otherwise, you may include seedlings from around the clump in replanting and seedlings are not likely to come true to color.

After you have finished cleaning up the borders or beds, dividing and replanting the perennials, fork pulverized sheep manure into the soil—this is an aid to better growth.

Biennials, such as Canterbury bells, foxgloves, sweet William, which were not planted in position in the fall, must be planted now. Fall is the preferred time for planting these flowers—remember this come another fall.

Columbines and delphiniums grow better if moved in the spring—and you will find it easier to grow new plants than to divide old ones. You can sow delphinium seeds early in March, if you have a greenhouse or other suitable facilities for raising seedlings. A good mixture in which to sow the seeds is made up of two parts of soil, one part of leafmold and one part of sand; dusting the seeds with "Semesan" before sowing is a precautionary measure that pays off—and also watch that the soil in the seed flat or pan does not dry before the seeds germinate. Plants from this early spring sowing will flower within six months and will make ideal plants for the perennial border the following spring. To control insects and diseases on delphinium, you can use the same spray materials as for roses.

Control of insects and fungus diseases seems to demand more time with each season — perhaps a few reminders will help. You should complete dormant spraying of apple and pear trees before any growth starts—if weather conditions are such as to prevent you from spraying until growth has started, you must then apply a weaker solution (consult the instructions on the container of the spray material). The delayed dormant spray must be applied before buds show green more than one-quarter of an inch. The dormant or delayed sprays are intended to kill all over-wintering insects, especially scale; therefore be sure you cover the main trunk and all the branches with the spray material.

Lilacs and some kinds of euonymus are subject to severe damage by scale —apply miscible oil sprays to them when spraying fruit trees.

For dormant spraying of peach, plum, and cherry trees, use lime sulphur. The spray materials to be used after the dormant spray depends upon the number and kind of trees. The owner of a few mixed fruit trees will find the new all-purpose sprays very good when applied at the right time—spray schedules are generally printed on container labels. Do keep your spraying equipment clean, and measure quantities accurately according to the instructions.

Gladiolus corms may be planted in the New York area from approximately April 15 to June 25. Three or four plantings can be made between these dates to provide a succession of bloom. Deep planting eliminates the need for staking so set the corms six inches deep, six inches apart in rows on fifteen-inch spacing; or dig out a trench six inches deep, eight inches wide, and plant two rows in each trench. Trenches should be spaced about two and a half feet apart center to center.

Hardy chrysanthemums which wintered over should be divided in the spring. Dig up the plant, shake off the dirt, then divide into small sections and replant as soon as possible. Now is the time to plant a line of chrysanthemums in the cut flower or vegetable garden for transplanting in the fall to locations around the house.

If you are going to grow vegetables, you ought to prepare a plan before you begin to fertilize the soil or sow seeds. Actually the area in which you want to raise carrots, parsnips, salsify, chicory, some varieties of beets and radishes, should have been given manure compost or fertilizer no later than the previous season. Most of the other vegetables do better if a liberal quantity of manure or compost is worked into the ground with a rototiller or plow; if the vegetable plot is small, you spade the manure into the soil. Along one end of the plot dig out a spade-wide trench and wheel this topsoil to the other end to fill in the last trench. Spread manure along the bottom of the trench, then turn over about a six-inch width, keeping an open trench for manure. The manure must be down deep enough so that it is not turned up during planting operations.

As soon as the soil is dry enough to be worked, you can sow peas. Make a small trench about six inches wide, two and a half inches deep, with a garden hoe and sow peas evenly about one inch to one and a half inches apart, then cover with soil. If you dust the seeds with a protectant, such as "Spergon," you will find it helps to prevent decay and damping off. It also permits earlier sowing. Allow three feet between the rows of early peas, four to four and a half feet between rows of late varieties. Dwarf peas may be spaced more closely, about two feet between rows, and because of this are more desirable for the small garden in which space is at a premium.

Lines of spinach or radishes may be sown between the rows of peas, or lettuce may be planted, for these crops will be used before the peas are ready for picking.

Carrots should be sown in rows fifteen inches apart and one inch deep; beets eighteen inches apart and two inches deep. Seed catalogs usually carry instructions on row spacing and depth to sow seeds.

Onion sets and cabbage plants should be set out about the time peas are sown. Snap beans are not sown generally until early May, though sowing of snap beans has been done successfully in northern New Jersey in late April. Beans from this early sowing have been found especially fine for canning and freezing—and are ready before the Asiatic beetle makes its appearance. Unfortunately, even when the small home owner conducts a regular spraying schedule in his own garden, he sometimes entertains unwelcome pests —this because his neighbor has not carried out control measures carefully.

Bush varieties of lima beans are most suitable for small gardens, and may be sown when the first sowing of corn is made—generally when fruit trees are in flower. "Spergon" can be applied to beans and corn to advantage, especially the early sowing.

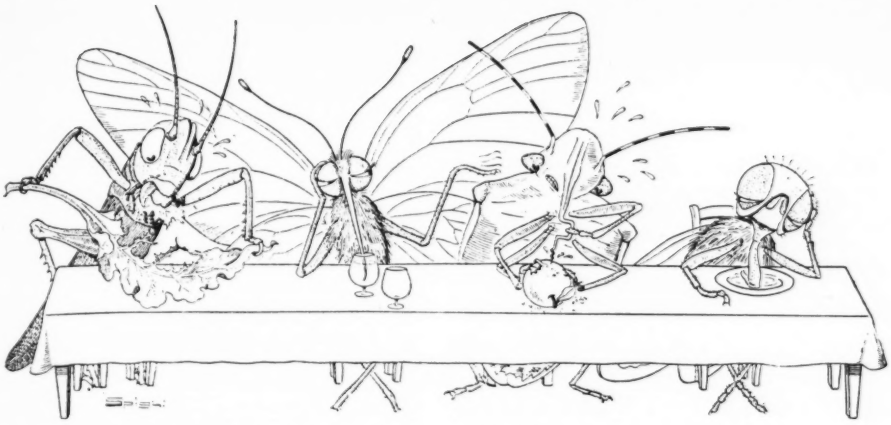
Corn may be grown in hills or rows —three lines is the least that should be planted at any one time to insure satisfactory pollinization and production of full ears. Single-line planting often results in ears with kernels only on one side.

JAMES M. GIBB

PEST CONTROL (from page 37)
antibiotic recently made available for the control of the bacterial disease of apple, pear, and other members of the rose family, known as fire blight. At the moment antibiotics for fire blight control (trade names "Agri-mycin," "Agristrep" and "Phytomycin") are relatively expensive and hence are used primarily by orchardists. In time, they

COMBINATION SPRAY FORMULA

Ingredient	Per Cent of Mixture	Quantities Required to Make	
Water		1 gal.	25 gals.
Methoxychlor (50% W.P.)	35	3 tbsp.	¾ lb.
Malathion (25% W.P.)	30	2 tbsp.	½ lb.
Captan (50% W.P.)	35	3 tbsp.	¾ lb.
Complete Mixture	100	8 tbsp.	2 lbs.



The Italian artist Spighi illustrates the different ways insects feed. Left to right: by chewing, piercing, boring, and sucking.

will be generally available for home gardeners.

Streptomycin has been found effective in controlling a great number of other bacterial diseases including those on beans, carnations, chrysanthemums, cucumbers, potatoes, peppers, tomatoes, and walnuts.

Combination Sprays

Combination, or all-purpose sprays, contain compatible materials capable of controlling all the major insect pests, fungus and bacterial diseases, as well as mites. There are a goodly number of ready-mixed combinations on the market, most of them in powdered form, which may be applied dry with a dusting machine or diluted in water and applied with a sprayer. Those prepared with so-called wettable powders are less desirable in some situations, because they leave quite a heavy, unsightly deposit.

Gardeners desiring to mix their own combination sprays can be guided by the spray chart on page 54. This includes the materials necessary for complete insect and disease control. Where mildew is a problem, "Mildex" (or "Karathane"), as directed on the package, can be included in the combination spray.

TEMPERING THE ELEMENTS (from page 47)

would eliminate such artificial frost pockets. When flowers escape the first frosts, often the blooming season of the garden may be extended two or three weeks. One who is uninterested in such aesthetic considerations should note that this logic is equally efficient for extending the season of garden tomatoes.

As important as flowers and shrubs are to gardens, the major benefits of intelligent site planning accrue to people. The possibilities of modifying climate extremes and using the principles of microclimatology in site planning to extend the season of outdoor garden use have a fine potential in the Northeast as well as in warmer areas of the country. The results in the Northeast, when successful, may be more dramatic because they are unexpected. Trees, shrubs, water, fences, vines, paving materials, groundcovers, soils, color and land forms are some of the superficial building materials of the garden designer and site planner. To exploit fully the potential of garden design and outdoor living, he must also appreciate and understand solar orientation, meteorological data available, geology, and topographic features of the area under study. Much of the local weather data must be measured directly for specific area, since general records are not specific enough.

Much has been written on the microclimate recently in a form which the layman can understand. Some of the garden magazines have contributed with articles written for folk who are not meteorologists. For the reader who wishes to make a more serious study and wants documented experimental data, *The Climate Near the Ground* by Professor Rudolph Geiger is required reading.

As long as architects were strapped by rigid stylistic concepts, complete exploitation of this field was difficult, if not impossible. Contemporary thinking of architects, landscape architects, city planners, and engineers is again coming to recognize that we can succeed better by using the great natural strength of the sun and wind to our advantage than by proceeding in spite of them.

FANNY STEVENSON
Gardener

By William J. Robbins

"Louis says that I have the soul of a peasant, not so much that I love working in the earth and with the earth, but because I like to know that it is my own earth that I am delving in. Had I the soul of an artist, the stupidity of possessions would have no power over me. He may be right. I would as soon think of renting a child to love as a piece of land.

"When I plant a seed or a root, I plant a bit of my heart with it and do not feel that I have finished when I have had my exercise and amusement. But I do not feel so far removed from God when the tender leaves put forth and I know that in a manner I am a creator. My heart melts over a bed of young peas and a blossom on my rose tree is like a poem written by my son."

This was written by Fanny Stevenson in 1890 in a diary she kept during the period she and Robert Stevenson lived on Samoa.

Fanny Stevenson may have had the soul of a peasant, but few could have expressed in such moving terms a love for the earth and the plants which grow from it. In fact, her diary is full of observations on plants and references to her efforts to grow on their estate, "Vailima," those already in Samoa and to introduce new ones. "In the garden the other day the men turned over a fungus that was enveloped in the most delicate lace-like fabric. I wish I were not so ignorant of these things."

"We had two trees cut down for the purpose [i.e. a new bridge]. One of them was of the most lovely pinkish wood with salmon-pink bark and emitted a perfume something like sassafrass and something like winter-green." At Levuka on Fiji, a Mr. Moore took Fanny to the botanical gardens "recently put under the charge of a pleasant, simple young fellow from Kew. I saw

(Continued on page 59)

The Exotic Garden of Monaco

By **Murray Wright**

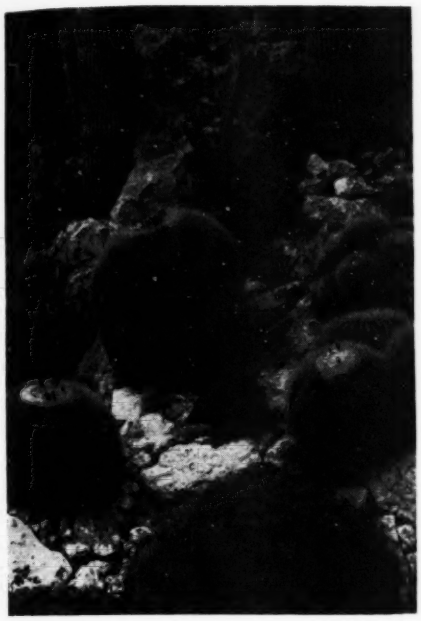
ALTHOUGH the climate of the French Riviera is most congenial for the growth of plants, yet there are few public gardens of merit in that locality. A notable exception is the Exotic Garden of Monaco which is devoted entirely to the cultivation of cacti and succulent plants. Comprising the finest collection of such plants in Europe, this garden is claimed to be unique throughout the world.

The Exotic Garden is situated a short distance to the west of Monte Carlo on the lower side of the middle Corniche road. There the garden has been constructed on the face of a steep cliff overlooking the blue Mediterranean, with the beautiful pigmy peninsula of Monaco in full view and the delightful resort of Monte Carlo stretching away on the left. The rocks of the cliff form a wonderful natural setting for the plants, and the southern aspect while allowing the maximum of sunshine provides shelter from the cold winds coming from the Alps.

The construction of the Exotic Garden was a formidable task and involved considerable terracing of the steep rock face, the hewing of paths from the solid rock, and the transport of large quantities of soil for the plants. Although the garden is so steep that it was at first rather appropriately called the "Hanging" Garden of Monaco, all parts of it are readily accessible because of the system of paths winding around and running back and forth across the slope. Flights of stone steps have also been constructed where necessary, and bridges have been erected to span the

Top. The beautiful resort of Monte Carlo viewed from the Exotic Garden of Monaco. The towers of the casino are seen in the center, close to the sea.

Bottom. Branched jointed euphorbias form an archway over a path in the Exotic Garden of Monaco.



Spherical echinocacti with columnar cerei in the background in the Exotic Garden of Monaco.

Columnar cerei with dwarf cerei in the foreground in the Exotic Garden of Monaco.

wider clefts and chasms. Along the paths seats have been placed at vantage points, where the visitor may rest while feasting his eyes on the variety, form, and color of the plants with which he is surrounded.

The credit for this fascinating garden belongs to Albert I, who was also the founder of the famous Oceanographic Museum of Monaco. He was Prince of Monaco from late in the last century until 1922. Prince Albert was a keen traveller and explorer and very much interested in all forms of natural life. On visits to various countries of the world, he collected cacti and similar plants which eventually formed the nucleus of the present collection in the Exotic Garden.

The actual construction of the garden was undertaken by M. Augustin Gastaud, gardener to Prince Albert. He was assisted by an architect and engineer named M. Louis Notari. Although the area is not extensive, the garden rises from near sea level to about one hundred and sixty yards and took many years to construct and furnish with plants. The task involved a great deal of hard work and ingenuity. From many places the stone had to be hewn away, at other points rocks were placed to form deep pockets for the plants. These cavities were afterwards filled with soil. For large specimens a common practice was to bury half a sheep at the bottom—this is said to have given excellent results.

The Exotic Garden is very well managed and everything possible is done to encourage the growth of individual specimens, promote flowering, and extend the collection. Many new species and varieties are raised from seed. Small and medium-sized plants have to be moved at regular intervals to make room for others, and considerable thinning out is necessary of self-rooted pieces which drop on the ground. The majority of the plants appear to flourish just as well as in their natural habitat. Some grow to a remarkable size, and their roots penetrate into crevices in the rockwork to an incredible depth.

A delightful prospect awaits the visitor to the Exotic Garden with its charming setting and lovely surroundings. Eastwards and westwards he is presented with wonderful vistas among the many variable and oddly-shaped specimens. The columnar cerei stand out boldly against the clear blue sky. Borne high up in the air the spikey leaves of the tree aloes radiate from long bare stems. Also spectacular are the taller euphorbias branched like trees. Other genera have a form rather similar to palms, while the well-known opuntias or prickly pears form an impenetrable barrier.

Some of the plants have a pendant habit and fall over the rocks like alpines; others such as *Cereus triangularis* are climbers and attach themselves to the stonework. Acting as a kind of groundcover are the shrubby euphorbias, the smaller aloes, the hard-leaved rosettes of agaves, and innumerable other species.

In one direction the peculiar wand-like stems of fouquieria have the sea as a pleasing background. Another viewpoint presents a group of magnificent spherical echinocacti and mammillaria, each one growing perfectly in what appears to be a bed of stones. Many other genera are there to interest the lover of cacti and succulents, such as yuccas, beschornerias, dyckias, mesembryanthemums, and every imaginable kind of cactus.

The Exotic Garden is always interesting and attractive—no particular month can be recommended in which to visit it. Practically all the year round some of the plants will be in flower. Particularly interesting in this respect are the aloes, agaves, mesembryanthemums, opuntias, and many cacti. Sometimes the blooms are followed by strange fruit which never fails to attract attention.

The Exotic Garden of Monaco has had but a short history as gardens go, but no place could have more fascination for all plant lovers. Year by year it will continue to improve and remain a permanent and delightful memorial to those who created it. Every one who spends a holiday on the French Riviera should pay this wonderful garden a visit.

Have you a friend who would enjoy the privileges of membership in The New York Botanical Garden?

Why not tell him about them—or if you prefer, please send his name to us and we shall be glad to mail him literature describing the privileges of such membership.

A member of The New York Botanical Garden also has the satisfaction of contributing to the advancement of the botanical and horticultural sciences.

THE NEW YORK BOTANICAL GARDEN
Bronx Park, New York 58,, N. Y.

FOR THE YOUNGER GENERATION OF GARDENERS

Grandpa's Letters to Janet

"The Buds are a Poppin'
and Spring has sprung
Tump ta de ah Da—Tum Tum"

THREE BOYS came through the big gates of The New York Botanical Garden. They stopped outside the door of the gate house and broke into a jig.

Mack, who was standing in the doorway, greeted them with a wide smile and said, "Hi! boys, where did that song and dance come from?" "Eagle Eye Eddie made it up and we think it is catchy." "Show me again," said Mack. He watched Eddie and tried it himself. Then he remembered he must be on his dignity at the gate house and said, "I like that and I'll practise it some more when there are no people around. I used to enjoy a good jig in my younger days."

"What brings all three of you up here today?" he asked the boys. "Teacher gave us an assignment. We are to bring in a composition on 'Signs of Spring.' It sounded very easy at first but when I started to write, that silly line about 'the flowers that bloom in the spring tra la' kept running through my mind, so I asked Joe and Charlie to come to the Garden for ideas."

"Well, you did right to come here for your material. The pussy willows are well advanced, you'll find skunk cabbage in the hollow, and forsythia buds are poppin'. If you know your birds, you will find the early ones in the Hemlock Forest and around the Rock Garden." Mack had noticed Snooper and Snuffy on the low branches of a nearby tree, but didn't tell the boys. As the boys sang their ditty and danced their jig, the squirrels watched them very intently.

Snooper whistled the Squad leaders' squiffle call, which brought the other three leaders promptly. He said to them, "Here is a new dance the boys have learned." "I'm sure squirrels could do it just as well as boys. Let's watch them closely." The boys hadn't seen the squirrels, but Mack had an idea of what was happening; so before the boys left him, he asked them to do the jig once more. All five squirrels watched carefully. Snooper said, "That's not hard to do. I'm sure I have it." The squad leaders were quite certain they could do it, too.

The boys walked away, and Mack went inside the gate house. He watched at the window, and do you know what he saw? The five squirrels came out of the tree and started to practise that jig on the lawn—in no time, they were giving a perfect performance. Mack was laughing so hard he had to hold his sides, and Grandpa laughed, too.

Mack said, "I'm not only laughing at what they are doing now—and goodness knows, that's funny enough—but I'm thinking of what is going to happen in the Botanical Garden today. Those squad leaders will teach that jig to all the squirrels in the park, and you will probably be reading about it in the newspapers."

"Tell me more about it," said Grandpa, and Mack told about the boys who had arrived at the gate, full of Spring, singing:

"The Buds are a poppin' and Spring has sprung"—then going into their jig with a "Tump ta de ah da — Tum Tum."

No one was in sight, so Mack did the jig for Grandpa. It was so catchy that Grandpa had to do that jig, too. "I've heard about jig time. This must be it," said he.

"Wait till the boys see all the squirrels in the Hemlock Forest doing their jig. Will they be surprised!" said Mack. An hour later when Grandpa met Eddie and his pals, they were standing with their mouths open in astonishment, watching a group of squirrels doing their jig. "But how in the world did they learn it?" they wanted to know. Fortunately, Grandpa was able to fill in the story for them. Otherwise, they never would have been able to concentrate on their "Signs of Spring" composition.

Tump ta de ah da! Spring has sprung! The gates to fairyland will soon be open. Of course, you know Grandpa means the Rock Garden. These gates have been locked all winter and the sign said, "No visitors until April 15." The plants, shrubs, trees and herbs, have been sleeping, but the animals have been active in the Rock Garden all winter long.

Birds fly in and squirrels climb the fence easily. To some of the little animals the closed season in the Rock Garden is the best time for them. Just as soon as the gates were locked last fall Ring Neck, the beautiful pheasant, came out of hiding and strutted around saying, "Cuk cuk, this is the life, no more dodging inquisitive humans."

"Oh, shucks," says purple grackle, "I shall miss the people who have been bringing me food." The pheasant replied, "Yes, you will, but if you do not watch out you will forget how to forage for yourself. It is not good to get lazy and depend on others." Several big frogs were sunning themselves on the bank of the pool. When the pheasant came along, they jumped quickly into the water. "You don't have to be afraid of me," said Ring Neck. "If I were a heron that would be different, for herons like to eat frogs."

Grandpa sat on a bench and watched a small flock of robins. Robins get along very well when they travel in flocks to and from the south where they spend the winter; the only time robins fight is in the spring after they have staked out their own special spots. If you could understand robin language, Janet, you would hear something like this: "Go away, I was here first, there is only enough food for Mrs. Robin and me and for our young robins, when Mrs. Robin hatches out the eggs. Go find another place; start now, or I shall nip you."

Next Grandpa watched a flock of gold finches (they don't look gold at all in late fall and winter). The gold finches visited the buffalo-berry tree. This is a favorite with all the birds. Only a few of the berries were left, but finches know how to find food all winter; they are seed eaters. Of course, warblers, vireos, and other worm eaters all went south. What about the robins, you want to know, Janet? Well, they prefer worms, but when the ground is too hard to get any worms, the robins can live on berries—dogwood, hackberries, bayberries, and, best of all, the robins like holly berries.

In another part of the Rock Garden,

Grandpa found a few white-throated sparrows and a hermit thrush. These birds leave the garden late in the fall and are among the early birds to return in the spring. The cardinals do not migrate but stay in the Botanical Garden all winter where they find enough food.

Woodpeckers drill for their food—the little downy goes "tack, tack, tack," and the hairy goes, "toc, toc, toc." While the woodpeckers go up the trunk of a tree, the nuthatch comes down the trunk — he is called the upside down bird. He finds the insect eggs that have been tucked in the upper scales of the bark. The chickadee has charge of all the slender branches right out to the very tips. These bark trimmers do a wonderful job in winter—without them the trees would be very wormy in spring.

Grandpa found a round hole in a dead tree—that's the entrance to a flicker's nest. I saw a flicker drag out a starling, which had tried to take possession of the nest.

Time for Grandpa to end this letter now, Janet. There will be more about The New York Botanical Garden another time.

FANNY STEVENSON (from page 55)

everything there and was told to mention what plants and trees I should like to carry away with me. I mentioned a great many—fruits, nuts and flowery trees and plants. I am, to my great delight, to have them all. It was a most exciting day for me." An Indian in a shop divides some Indian melon seeds with her and tells her how to plant them. Coffee plants and cocoa seedlings are set out, the garden weeded. "I said I was tired; it is a mild phrase; my back aches like tooth-ache; when I shut my eyes to sleep I know I shall see before them—endless vivid deeps of grass and weed,—so that I shall be inert in body and transact for hours my daily business, choosing the noxious from the useful. And in my dreams I shall be hauling on recalcitrants and suffering stings from nettles, stabs from citron thorns, fiery bites from ants, sickening resistances of mud and slime, evasions of slimy roots, dead weight of heat—living over again at large the business of my day."

Fanny Stevenson, wife of Robert Louis Stevenson, was born March 10, 1840, in Indianapolis, Indiana. Her name was Frances Matilda Van de Grift. When she was seventeen, she married Samuel Osbourne in Indianapolis and moved to California. Before long, Samuel demonstrated his undependability as a husband, and in 1875 Fanny and her three children sailed for Europe where the youngest died at an early age. In 1876 in Grez, France, Fanny met Robert Louis Stevenson; they fell in love and two years later Fanny returned to the United States, won a divorce from Sam, and settled in Monterey where Louis and Fanny were married in May 1880. Their marriage was followed by a search for a place where Louis' health might be improved, and they finally settled in Samoa in 1890, having purchased ground for what was to become their estate, "Vailima." There they lived for four years until the sudden death of Robert Louis Stevenson in December 1874.

Fanny was in the habit of keeping diaries, and she kept one from the beginning of their stay at "Vailima" in September 1890 until the end of July 1893. The diary eventually reached the hands of an Englishwoman who sent it to Fanny's son, Lloyd Osbourne. It then came into the possession of her daughter, Belle, who deeded it to the State of California. The manuscript was received by the state in 1949 and placed in the Stevenson house in Monterey. It has been edited by Charles Neider who has included with the diary appropriate extracts from the "Vailima Letters" written by Stevenson to his friend, Sidney Colvin. The book was published in 1955 by Harper & Brothers under the title *Our Samoan Adventure* by Fanny and Robert Louis Stevenson.

Portions of the diary had been cross-hatched out by a modern pen. The editor has succeeded in bringing the original to life in most instances by the use of ultraviolet and infrared lighting, and one of the sections so rescued is quoted in part at the begining of this article.

After Stevenson's death, Fanny left Samoa, traveled and lived in Europe, Mexico, and Hawaii, and eventually settled in Santa Barbara where she died in 1914 at the age of seventy-four.

Fanny Stevenson, as revealed in this diary, was an extraordinary woman and not the least of her admirable attributes was her love for gardening.

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BOOK REVIEWS

F. SCHUYLER MATHEWS' FIELD BOOK OF AMERICAN WILD FLOWERS. Completely revised and enlarged by Norman Taylor. 601 pages, illustrated by F. Schuyler Mathews and Eduardo Salgado; indexed. G. P. Putnam's Sons, New York. 1955. $5

I have long considered F. Schuyler Mathews' *Field Book of American Wild Flowers* the best and most useable wild flower book for non-botanists in northeastern United States. In addition to being very inclusive, it is profusely illustrated with excellent drawings and a few colored plates. It is small enough to be easily carried into the field. A drawback in recent years has been that its nomenclature was out of date. I am glad to report that this failing has been corrected in the new, fourth edition revised and edited by Norman Taylor. This edition is the same size as earlier ones except that it contains nearly fifty additional pages. The increase is due to the inclusion of a number of species, mainly showy, common introduced plants, not included by Mathews. It contains the same drawings as earlier editions and the newly included plants have been illustrated with the same degree of excellence. Mathews' feature of two pages of drawings of pollinating insects has been dropped with no serious loss. For some reason, the roses and the members of the buckthorne and grape families have also been deleted. This I do consider a fault but, despite it, I should not hesitate to recommend the book as the best, inexpensive and handy-sized aid to the identification of wild flowers.

DONALD G. HUTTLESTON
Taxonomist, Longwood Gardens
Kennett Square, Pa.

WILD FLOWER GARDENING. Norman Taylor. 128 pages, illustrated with color plates; indexed. D. Van Nostrand, Princeton, N. J. 1955. $3.95

Norman Taylor, most famous for his *Encyclopedia of Gardening,* has added still another book to his long list for home gardeners. Apparently intended as a running mate for his recent revision of the old Mathews' *Field Book of American Wild Flowers,* it discusses a fairly large number of natives. After some introductory material on the likes and dislikes, cultural requirements, and general conservation of wild flowers, he takes up the plants in groups according to their choice of environment, such as plants for woodland gardens and those for the sands and seashore.

A very worthwhile section is Chapter V, given over to the differences between bogs, marshes, wet meadows, and swamps and the plants that grow in each. I find that even a large share of the ardent wild flower lovers have only the haziest idea of how a bog differs from a marsh and what it means in terms of plant life.

In each listing, there is an accurate but simple description of the plant, a good description of its environmental wants, and occasionally some advice on its culture or propagation. I think the jacket writer waxed just a bit over-enthusiastic when he said the book "describes the cultivation" of American wild flowers. One may be led to believe that the culture of each plant is given in detail. I prefer to think of this book as filling in the gap between the purely descriptive field book written for identification and a book clearly placing its emphasis upon culture.

Another point of importance is the fact that all names are based upon The New York Botanical Garden's recent and monumental revision of Britton and Brown's *Illustrated Flora of the Eastern United States and Adjacent Canada.* This is not true of many wild flower books. Most are out-of-date in this respect, being based upon old and out-dated authorities.

Besides a number of black and white line drawings, the book is illustrated with thirty-two pages of color, covering more than eighty species. Unfortunately in those copies I have seen, some could be clearer and the names accompanying them are not always in accordance with the text, although the author has attempted to compensate for this by explanations in the text.

In summation, I feel that there is no one who cannot learn something from this book, just as I have learned from it, too. It will find a definite place in our wild flower literature.

EDWIN F. STEFFEK
Darien, Conn.

OUR NATIONAL FORESTS. Bernard Frank. Foreword by Justice Wm. O. Douglas. 238 pages, illustrated, indexed. University of Oklahoma Press, Norman, Okla. 1955. $4

"The average American still cannot distinguish between national forests and national parks, despite many sharp differences in their purposes and activities." This passage, which appears near the beginning of Chapter Two of *Our National Forests* (not to be confused with the earlier account by Boerker, Macmillan 1918, bearing the same title) may well be employed as a text for the work and as a guide-post for the reader. Most people *don't* understand the differences between these two categories of federally-owned lands (any more than, in New York, they know the difference between the "Forest Preserve" and the "State Forests!"); but a reading of Bernard Frank's book will certainly help to remedy this situation. It is not a "popular" book in the newsstand sense, but is adapted for those who have an adult interest in forest conservation in its broadest sense, and who are presumed to have some existing knowledge about trees and the out-of-doors generally. Yet, despite the scope of the subject matter and the wealth of factual detail in which it is treated, the book is extremely readable. Mr. Frank, notwithstanding his distinction as a technical authority in the field of watershed management, and his position as Assistant Chief of Watershed Management Research in the U. S. Forest Service, has not forgotten how to write. The story "moves along," and statistics are leavened by homely anecdote, stimulating discussion of public policy, and descriptive passages of genuine literary merit. Particularly informative, in the Appendix, is the catalog of the National Forests by states, describing their location, terrain, and features of special interest.

In his final chapter entitled "Questions for the Future," Mr. Frank discusses some of the current and pending issues involving the use of the National Forests. One of these that hung in the balance as his book went to press—legislation to grant special grazing privileges to livestock operators on the National Forests—was subsequently decided in the 2d Session of the 83d Congress, by the defeat of the Hope Bill (HR6787) and the refusal of the House-Senate Conference Committee to include the provisions of the Aiken-Thye Bill (S 2548) as a "rider" to the Agriculture Price Support Bill (HR-9680). This action, which was brought about in large measure by unfavorable publicity given to the bills by conservation organizations and certain crusading editors and reporters, apparently closes a long chapter in the attempts by private individuals and groups to gain a vested interest in grazing on public lands in the West.

One would hardly expect a work of this scope to be without a few factual errors. Thus, on page 135, and again on page 221, the Allegheny National Forest in Pennsylvania is described as occupying a "glaciated plateau" when in fact most, if not all, of this forest is situated on that portion of the plateau which was *not* glaciated. Also, on page 180, the Atlantic Hurricane of 1938 is said to have occurred in the month of November when, as all good New Englanders will remember, it happened on September twenty-first! These minor errors, however, do not detract from the very high value of the book as a whole.

E. W. LITTLEFIELD
N. Y. State Conservation Dept.
Albany, N.Y.

THE BILTMORE STORY. Carl Alwin Schenck. 224 pages, illustrated, indexed. Edited by Ovid Butler. American Forest History Foundation, Minnesota Historical Society, St. Paul. 1955. $3.95

The Biltmore Story deals with the beginning of forestry in the United States. With the arrival of Dr. Carl A. Schenck from Darmstadt, Germany, in 1895 at the Biltmore Estate, near Ashville, N.C., the attempt at private forestry in this country was launched. The Biltmore Forestry School, also the first in this country, which Schenck started there produced the vanguard of professional foresters in America.

It describes the impressions of Schenck when he found both forest and economic conditions differed so widely from those in his native Germany. The reference to the other early foresters and their mistakes, as well as accomplishments, is especially interesting to those who knew or recall the names of Pinchot, Price, Fernow, Roth, Graves, Griffith, and Rothrock during those pioneering days of forestry in this country.

All of these European-trained foresters had difficulty in applying the European systems of silviculture to the variegated types of mixed stands of timber in South Carolina. They made mistakes and had plenty of headaches. Yet, the story of forestry unfolds as one turns the pages of this book. It gives a brief summary of the first real forest working plan made in the U.S.A. It also presents the facts regarding the attempts and failure to practise forestry in the Adirondacks of New York in the early part of this century.

Every forester should read *The Biltmore Story.* The "Old Timers" will enjoy the historical aspects of forestry in this country, while the recent graduates may profit by their mistakes.

R. R. FENSKA
Bartlett Tree Expert Co.
White Plains, N. Y.

TIMBER IN YOUR LIFE. Arthur H. Carhart. 317 pages, introduction by Bernard De Voto; indexed. J. B. Lippincott, Philadelphia, Pa. 1955. $4

Mr. Carhart, the author of a number of conservation books, here presents a picture of the timber reserves and their use which should be arresting to those of us who retain our complacent attitude to this important question.

The book is intended to show on analytical and historic grounds the reasons for present and predicted shortages. One of its very strong points is the way in which the history of timber use is presented. The details of strife between commercial interests, government, and the private agencies and associations which have concerned themselves with our natural resources are most interesting.

I was interested in one aspect of the subject which the author covers particularly well. Continued complacency on the part of the public is encouraged by such news as the recent release which reported growth to have reached an equilibrium with harvest in our forests. As Mr. Carhart points out, this may well be so but gross increment is not the important statistic. Rather, the amount of wood of the type required is important. And here, we continue short of equilibrium.

The book is marred by some rather surprising lapses in fact. Most of these are in the direction of oversimplification. Without going into the details of the latest experimental results, I think the author could have done better than to call amino acids "aminos" (p. 115). Sapwood does not commonly become heartwood during its first season as implied (p. 117). A leaf is a bit more than "an outward extension of the cambium layer." Photosynthesis is a bit more complicated than "the carbon atom is split from the CO_2 gas, an oxygen atom is taken from the H_2O of water, and starch, a carbohydrate, is produced" (p. 120).

Such treatment of scientific matters makes the reviewer wonder a little bit whether there has been a tendency to elide some of the statistical material. However, the book seems stronger in statistical documentation than in any other department and such misgivings may be unjustified.

What the book does is simply to present a picture of the importance of timber in our lives and to discuss the nature of present and future problems in the realm of forestry. It is interesting and readable, and it may well go a long way to fill an important need.

W. R. Henson
Asst. Prof. of Forest Entomology
Yale University, School of Forestry

CULPEPER'S COMPLETE HERBAL. 430 pages, illustrated with colored plates. Distributed by Sterling Publishing Co., Inc., New York. 1955. (Printed in Great Britain.) $4.50

Nicholas Culpeper compiled the first edition of this herbal in 1652 with facts and fancies gleaned, no doubt, from earlier writers as well as from experiences in his own practice. He has been variously characterized as quack, infamous, and charlatan, yet "Godlike in his aims." These attributes may have contributed to this resultant volume which is, conservatively, the fourteenth edition. Culpeper, astrologer-physician, "lovable rogue," was shocked into his belief in the influence of the planets, when the heiress with whom he was eloping was struck by lightning on her way to meet him! . . . "Mars and the envious planets intervening," he ruefully surmised and not only plunged into his life work of herbal remedies but married and had seven children! His preface states that "diseases vary according to the motion of the stars," and his remedies reflect the relationships between planets and plants. Do re-read "A Doctor of Medicine" in Kipling's *Rewards and Fairies* for his theory in action in the enthralling tale of the plague-stricken village.

This printing is a reprint of one published around 1825, although both are undated, with the same simple drawings of plants—at times inaccurate, as those of goldenrod, of bedstraw, and the coloring of saponaria. There are instructions for gathering, drying, and the making of herbal compounds, as well as ailments relieved. There are germs of truth in many of the remedies—the author had an alibi, "It is an experiment worth trying and can do no harm." In the case of goat-herb, our pestiferous *Aegopodium*, he wrote, "neither is it to be supposed that goutweed has its name for nothing, but upon experience it heals the gout and sciatica."

There are more things—and who are we, admittedly benefitted by the discovery of antibiotics and other heretofore mysteriously "primitive" healing agents, to assert that our health, actions, and our very lives are not governed by the stars.

Elizabeth Remsen Van Brunt
Kitchawan, N. Y.

SHADY GARDENS. HOW TO PLAN AND GROW THEM. Emily Seaber Parcher. 282 pages, illustrated, indexed. Prentice-Hall, New York. 1955. $4.95

There is a good deal of common sense in this book of Emily Seaber Parcher's on *Shady Gardens*. It is a welcome attitude, for one cannot garden in the shade without having some of this all too rare quality, plus a somewhat stubborn strain of enthusiasm, which is also present in these pages. The author impresses upon the owner of a shaded garden that this book can only make suggestions—"you must learn to experiment with your shade and with your plants." She reiterates that if you want a good garden in the shade, there must be extra effort in applying both water and fertilizer, and this is best done by the addition of humus.

The book is well organized, being divided into three sections. Part One, "You can have Flowers in the Shade," starts with a chapter entitled "Shade and Degrees of Shade," a discussion vital to the problem. Following are chapters on spring wild flowers, other spring perennials, summer and fall perennials, annuals, and bulbs, each with a good list at the end. Part Two deals with "Foliage and Woody Plants." This includes ferns, house plants which may be used to advantage in the garden, groundcovers, vines and shrubs, both deciduous and evergreen.

The lists at the end of each of these chapters are doubtless the most helpful part of the book, but some of the suggested plants I should not have recommended. Some like meconopsis are not only difficult but almost impossible to grow in many parts of this country. Others like the lysimachias are bad spreaders and not easy to control. The reader is warned, but the warning ought to be underlined! However the lists are, on the whole, full of valuable suggestions with brief descriptions as to color, height, and cultural information.

Part Three is concerned with "Planning and Maintaining the Shady Garden." There is a chapter on design, one on special gardens, including city gardens and pool gardens. Towards the end of the book you come upon the troubles, other than shade, which come to all gardens. The chapter is headed "Prayers and Sprayers." We are glad there is a warning here against too much chemical spraying and a caution about labor-saving gadgets.

Shady Gardens deals thoroughly with all the problems involved—there is much information here which should prove useful to all who garden in the shade.

Estelle L. Sharp
Berwyn, Pa.

HOW TO GROW ROSES. John Paul Edwards. 88 pages, illustrated; index of rose varieties. Lane Publishing Co., Menlo Park, Calif. 1955. $1.50

Written from California, and doubtless more valuable for the West Coast than many other rose books, *How To Grow Roses* is also worth far more than its slight cost to rose lovers in any part of the country. With a modern approach, written to show the changes that make the rose more adapable to present-day landscaping, it is also all-inclusive, starting with the "Queen of Flowers" thirty-five (or seventy) million years ago and tracing her motif down through the ages.

Chapter Two, "Which is the Rose for You?" gives the usual classification of types and then, in only five pages, an unusually fine, concise chart of about a hundred varieties, with notations on color, fragrance, disease resistance, height, habit of

(Continued on page 63)

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NEWS, NOTES and COMMENTS

The Gertrude Simmons Burlingham Collections and Fellowship. During her long and scientifically active life, Dr. Gertrude Simmons Burlingham made herself the leading authority on the mushroom genera *Russula* and *Lactaria* of the western hemisphere. Her first paper on these fungi was published in 1902 while she was a student at The New York Botanical Garden, and her last in 1945 from her home in Florida; between these she wrote many others, of which the most comprehensive are her treatments of these large and difficult genera in North American Flora. Upon her death in 1952, Dr. Burlingham bequeathed her mycological collections and library to the Garden. The library includes, in addition to sets of a number of major botanical journals, many of the important works on higher fungi from the time of Fries to the present, and many reprints and monographic works on the genera that were her special field. The herbarium comprises some ten thousand specimens, mostly of *Russula* and *Lactaria,* but including other genera of which she made a particular study. These specimens are in excellent condition, accompanied by careful notes and spore-prints, and uniformly boxed. This very extensive set of critically annotated materials is the most notable addition to the Garden's Herbarium received in a number of years; the collection is housed intact in four cases in the cryptogamic herbarium.

Recently her friend and executrix, Miss Gertrude C. Sturges, has given Miss Burlingham's microscope to the Garden for use in the cryptogamic herbarium and has established The Gertrude S. Burlingham Fellowship in Mycology, with a stipend of $700. The fellowship, the microscope, the herbarium, and the library will all be employed in advancing the study of fungi, to the knowledge of which Dr. Burlingham made such notable contributions.

DONALD P. ROGERS

Activities of Herbarium Staff Members. Dr. David D. Keck, Assistant Director and Head Curator, has been very much occupied in the preparation of an article on "taxonomy today" which will be included in volume 3 or 4 of the *Survey of Biological Progress,* edited by Bentley Glass and published by John Hopkins Press. Dr. Keck will use material from this article at the University of Michigan Annual Biological Symposium for 1956, in which he has been invited to participate.

Dr. Bassett Maguire, Curator and Coordinator of Tropical Research, will leave for Europe late this spring to spend some time studying at botanical centers and lecturing abroad.

Dr. John Wurdack, Assistant Curator and Joseph Monachino, Associate Custodian of the Herbarium, returned the end of February from a collecting expedition along the Orinoco River in Venezuela. They brought back with them some interesting plant finds.

Plant Collecting in Pacific Northwest. Dr. Arthur Cronquist, Associate Curator of The New York Botanical Garden, spent the summer of 1955 collecting in the Pacific Northwest. He collected more than five thousand specimens, representing more than three hundred numbers in Montana, Oregon, and Idaho. Several plants not previously known from the area were found; one plant, a dwarf alpine willow, may prove to be an undescribed species.

Vascular Plants of the Pacific Northwest. This is a projected five-volume flora by C. L. Hitchcock (University of Washington), Arthur Cronquist (The New York Botanical Garden), Marion Ownbey (State College of Washington), and J. W. Thompson (University of Washington). Volume 5, covering the Compositae and written by Dr. Cronquist, was published in November 1955 by the University of Washington Press. This volume was illustrated by John Rumley, supported by funds from the State College of Washington.

The text of Volumes 3 and 4 is now nearly finished. $5,900 has been granted by the National Science Foundation to pay for illustrating these two volumes of the *Vascular Plants of the Pacific Northwest.* The money becomes available July 1, 1956. Mrs. Carl F. Janish of Las Vegas, Nevada, a well-known illustrator of floras, began work on Volume 4 in July 1955 on University of Washington funds and will continue on such funds until this coming July. The National Science Foundation grant will be handled through the University of Washington.

Addition to the Garden's Circulating Library. The following juvenile books, written by Alice Curtis Desmond, have been added to the Circulating Library, recently inaugurated for the benefit of the members of The New York Botanical Garden: *The Talking Tree, the Lucky Llama, Jorge's Journey, Barnum Presents, General Tom Thumb,* and *Feathers, The Story of a Rhea.*

As announced in the January-February 1956 issue of The Garden Journal, books on the list are available to members only for a free period of two weeks—thereafter at a 5c daily charge. Members are expected to assume the cost of postage both ways; a small envelope will be provided in which to insert stamps to the amount of postage on the wrapping.

Elected to Board of Managers. W. Earle Andrews was elected a member of the Board of Managers of The New York Botanical Garden, at the meeting of the Board on October 20, 1955, to fill a vacancy in the Class of 1958.

Advisory Council. At the annual meeting of the Advisory Council of The New York Botanical Garden, Mrs. Volney F. Righter was elected recording secretary succeeding Mrs. Harold Ruckman Mixsell. The other officers remain the same: Mrs. John D. Beals, Jr., Chairman; Mrs. John E. Parsons, First Vice-Chairman; Mrs. John E. Lockwood, Second Vice-Chairman; Mrs. Antonie P. Voislawsky, Corresponding Secretary; and Mrs. Richard de Wolfe Brixey, Treasurer.

Additional Permanent Exhibits in the Museum Building. The Display Committee is busily engaged in setting up additional permanent exhibits on grains which will be accommodated in the west wing, first floor, of the Museum and Administration Building of The New York Botanical Garden. During the preparation of these new exhibits, the west wing is temporarily closed.

Nineteenth Flower Show School, Course IV, the Garden Club of New Jersey, will be held on April 10, 11, 12, 1956, at the club's headquarters, 369 Park Avenue, Orange, N. J. For information and registration write to Mrs. James W. Gearhart, 35 Park Street, Montclair, N. J.

The Eighth Garden State Flower Show will be held at the headquarters of the Garden Club of New Jersey, 369 Park Avenue, Orange, N. J., on May 15, 16, and 17, 1 to 10 P.M. "Open House" is the theme, with a different schedule each day keyed to tradition, transition, today and tomorrow. A different nearby garden will be open to visitors each day.

Tessie K. Scharps Memorial Life Membership. Dr. George H. M. Lawrence, Director of the Bailey Hortorium at Cornell University, has been awarded the Tessie K. Scharps Memorial Life Membership by the Horticultural Society of New York in recognition of his outstanding service to horticulture. The announcement was made at the annual meeting of the Society on January 18, 1956.

The Mianus River Gorge is Saved. Strategically located in the northwestern corner of Greenwich, Fairfield County, Conn., and adjacent Westchester County, N. Y., is a beautiful valley with a rushing stream of water called the Mianus River. This is one of the last remaining wilderness tracts in the New York metropolitan area, and conservationists and lovers of the great outdoors have been deeply concerned with its preservation.

Enough money has been pledged and enough land promised by gift deeds to save the one hundred and twenty-five acres of virgin hemlock forest. The united effort to acquire this land as a conservation project involved two states, four townships, twenty land owners, and a water company and took the cooperation of nearly forty garden clubs and Audubon societies, the American Nature Association, and seven hundred individuals, including Boy Scout troops and school children.

The first sixty acres of land was purchased at a cost of $30,000, with the Greenwich Garden Club, of the Garden Club of America, contributing ten percent of this sum and Nature Conservancy giving a grant of $7,000. The Nature Conservancy, a national organization dedicated to preserve America's natural beauty areas and the parent organization of the local Mianus River Gorge Conservation Committee, seeks approximately $30,000 to establish an endowment fund for protecting and maintaining the Mianus River Gorge.

First Annual New England Daffodil Show of the American Daffodil Society will be held at the Putnam Trust Company Drive-In Office, Greenwich, Conn., on April 24, 2 to 10 P.M., and April 25, 9 A.M. to 6 P.M.

The show will be presented by the Garden Club of Old Greenwich, Green Fingers Garden Club, Greenwich Garden Club, Hortulus, Knollwood Garden Club, Mianus River Garden Club, Riverside Garden Club, Westchester - Fairfield Horticultural Society, Women's Club Gardeners.

Classes and horticultural arrangements

are open to all—and the exhibition is open to the public without admission charge.

This is the first joint endeavor of all the garden clubs in Greenwich in the field of horticulture. For entry blanks write to Mrs. C. M. Mackall, Edgewood Drive, Greenwich, Conn.

Archer M. Huntington, a member of the Corporation of The New York Botanical Garden since January 12, 1914, passed away the week of December 12, 1955.

Mrs. Henry St. Clair Putnam, a member of the Advisory Council since February 20, 1931, and a member of the Corporation of The New York Botanical Garden since January 9, 1933, died December 18, 1955.

Mrs. Anna Gilman Sargent Hill, widow of Robert C. Hill, died December 27, 1955, at "Niederhurst," her home in Palisades, N. Y., at the age of eighty-three. For many years she took an active part in the affairs of the Garden Club of America. Mrs. Hill was elected a member of the Women's Auxiliary of The New York Botanical Garden on June 5, 1919, from which she resigned in the early 1930's; she served as a member of the Advisory Council of the Garden since February 23, 1950.

BOOK REVIEWS (from page 61)

growth, American Rose Society rating, climate adaptability, and salient characteristics. Some of the newer roses are shown in eight color pages. Mr. Edwards refutes the idea that old roses were more fragrant than those of today.

The chapters on How to Buy, How to Plant, How to Water, How to Feed, How to Prune and Train, and How to Propagate Roses are sound and well illustrated. Chapter Four, "How to Use Roses in Your Garden" presents excellent photographs of roses in raised, walled beds, along driveways and parking strips, as hedges, in patios, as foundation planting, and in boxes. No one could look at these without learning of another place to put roses around the home. Due attention is paid to the increasing practice of growing roses in containers.

Diseases and pests are treated in detail, and somewhat from a West Coast standpoint, although those of other sections are included.

CYNTHIA WESTCOTT
Glen Ridge, N. J.

THE COMPLETE BOOK OF ANNUALS. F. F. Rockwell and Esther C. Grayson. 315 pages, illustrated with 93 photographs by the authors, 29 in full color (and drawings by Katharine Burton); indexed. American Garden Guild & Doubleday, Garden City, N. Y. $5.95

Annuals are a perpetual subject and there could have been no happier combination than the Rockwells, Fred and Esther, as authors. Even seasoned gardeners are too prone to brush annual flowering plants off with the thought that a few dozen plants, grown from seed or from plants obtained from the nearest grocery or florist store, will fill up the gaps in the border.

Fortunately, annuals are a much larger and more important subject than that, and the Rockwells have done well by it. Experienced and professional gardeners will find information and ideas in this book that will make the culture of annuals a more pleasant as well as a more productive part of gardening as a whole.

The classes and lists of annuals, or plants treated as annuals, are comprehensive and very useful for reference. In addition to the usual zinnias, marigolds, petunias, the more uncommon ones are discussed; these include tender shrubs and bulbs such as dahlias which are easily grown and flowered the first season from seed.

There are chapters devoted to the preservation of annuals and other plants, also flower arrangements; in fact this volume, which is amply illustrated in full-color kodachrome and in black and white, elevates annuals to a higher plane in the garden scheme than one might suppose possible. Indeed, annuals are as indispensable in the average garden as soil and sun, and as pleasurable, especially when the perennials are dormant or loafing.

Invaluable is a section devoted to the more important annuals in detail as to culture and management. There is a place for this useful and decorative book even after advances in plant breeding give us newer and finer varieties than we have today.

ANDREW S. WING
Riverside, Conn.

FRUIT AND VEGETABLE ARRANGEMENTS. Edited by Emma H. Cyphers. 128 pages, illustrated, indexed. Hearthside Press, New York. 1955. $3.50

Fruit and Vegetable Arrangements is unique, instructive, and inspirational. It is the only book devoted exclusively to featuring fruit and vegetables as decorations. How these may be used alone or combined with flowers, foliage, and driftwood are portrayed.

Mrs. Cyphers discusses and illustrates how to select forms, hues, and textures so that the combination of these create a relationship of beauty. Specific information is also given on how to dry, preserve, wire, shellac, and frost fruits and vegetables. Other chapters demonstrate how to make distinctive arrangements not only for Thanksgiving, Christmas, St. Valentine's Day, and many other memorable occasions but for the family meals the year around.

Emma H. Cyphers is well known as an exhibitor, a lecturer, and an author. The quality of her artistic designs is indicated in some of the photographs in the book, but she has also incorporated arrangements of many well-known artists. She is an accredited flower show judge of the National Council of State Garden Clubs and a former chairman of Flower Show Schools of the National Council of State Garden Clubs.

If you are looking for an attractive book, *Fruit and Vegetable Arrangements* is recommended. It is one to encourage the beginner and improve the skill of the accomplished.

VERA S. NILSON
Chatham, N. J.

CREATIVE FLOWER ARRANGING. Margaret Carrick. 192 pages, illustrated (photographs by Jack Carrick); indexed. M. Barrows, New York. 1955. $4.50

With sensible and brilliant use of the principles of all creative art, Margaret Carrick has tremendous vitality in her arrangements. She opens your eyes to the use of baskets, and will cheer up any basket collector with suggestions for use of different types and also how to store them. She finds magic in glass and develops a new idea in Calder type mobiles, which will lead the arranger right into the hardware store for dowels, clothes pins, and string. When you find a husband and wife team—photographer and flower arranger—you can be sure that the work will illustrate special features, it will be spontaneous with easy-to-find materials, and will show great study in accessory placement. In one hundred and fifty-eight illustrations in black and white and four in color, Jack Carrick has captured the roundness of his wife's arrangements. Her most abstract and imaginative arrangements are brought within the grasp of anyone by her explanations and her demonstrations of mechanical means. She shows how to make kitchen bowls look elegant. Margaret Carrick recognizes the influences which are stifling creative flower arrangement and, without sacrificing one basic principle, shows an infinite capacity for variation.

MARGET COCHRANE COLE
Flower Arrangement Editor
"Flower Grower Magazine"

JAPANESE FLOWER ARRANGEMENT. Seido Iwata. Black and white and color plates of flower arrangements, with some text in back of book. Studio Publications, New York. 1955. Printed in Japan. $6.95

Contents noted in a very short time — twenty-nine flower arrangement plates (twenty-one in color), twenty-four plates illustrating mechanics, two pages of Preface and four and one-quarter pages describing the Seki-So-Ryu School of Flower Arrangement.

For an art that requires so very many years to perfect the training, I feel there is too little reading matter, too little explanation.

The arrangements, in most cases, are lovely and fresh in feeling. However, I do get the impression that some of the arrangements would be without balance or stability, except for their placement on the page. This placement or setting coincides

(Continued on page 64)

HEDERA HELIX
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Rooted cuttings of this unusual ivy, which maintains a good evergreen appearance through the winter, are offered to our members at these prices:

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LET THERE BE HERBS

In celebration of the two hundred and fiftieth anniversary of Benjamin Franklin's birth, the Yale University Press has published a selection of twenty-seven of his personal letters. In the slim volume is a letter to Sir Joseph Banks, one of the great patrons of botany of the period and then President of the Royal Society in England. It was to him that the library and collections of Linnaeus were first offered, and he declined to buy them.

Fortunately for England, he mentioned this opportunity to a young physician named Sir James Edward Smith. After much negotiating Smith made the famous purchase which included, according to a letter to his father, "2,000 volumes, 19,000 plants, insects, shells, minerals, 45 birds in cages and valuable manuscripts." Sir Joseph Banks later became an honorary member of the Linnaean Society, which Sir James Smith founded to preserve for and present the library to posterity.

Apparently Banks held none of the rancor of which a friend warned Smith in the following words when the idea of the Society was first proposed:

"Even the idea of associating should be foreign to our first purposes and only meet as select friends. Under this view we raise no envious spirits against us from the present existing society; and prevent in future that acrimony which, I am sorry to say, exists too much amongst ingenious people. In short I am horribly afraid of a wasp's nest."

Lady Smith tells the story of the excitement which the news of the sale of the library to an Englishman aroused in Sweden:

"The ship which was conveying this valuable cargo had just sailed, when the king of Sweden, Gustavus III., who had been absent in France, returned home, and sent a vessel to the Sound, to intercept its voyage; but happily it was too late . . . The whole cost of the collection, including the freight, was 1,088 pounds five shillings."

Sir James's purpose in starting the Linnaean Society might have been that of fulfilling a personal need as he said, "My heart is formed for friendship, and cannot exist without it." His wife's two-volume collection of his letters describes it this way:

"This Society is almost a solitary example of an institution deriving its origin from an individual, young and unknown to fame, without rank, without wealth, without support, whose ardour for the persuit of science led him to risk the expectation of a moderate independence, by bringing into his native country, at the expense of his patrimony, those rich materials for which princes had contended, and upon which he was to establish a new Society, and give to its name, its character and direction."

Smith served the Society as President from the time of its beginning, in 1790, with thirty-six Fellows and sixteen Associates, until his death in 1828. The Linnaean Society still flourishes in its present home at Burlington House, and the Library of Linnaeus is examined by students of botany with as much zest as Sir Joseph Banks and Sir James unpacked and arranged it upon its arrival in England. Smith defended his spelling of the great Swede's name, in a letter to the editor of The Monthly Magazine, which retained the dipthong but regretted its omission in the charter of the Society which was spelled Linnean.

A similar controversy has always raged around the spelling of John Gerard's name which was printed with an added "e" on the first page of the early edition, 1597, of his Herbal. No doubt it will be a subject to intrigue the members of The Gerard Society, founded in Falls Village, Connecticut, January 1956, by a descendant of Sir James Edward Smith, to preserve a library of old English herbals and for the study of plants of usefulness to man, past, present and future.

GERTRUDE B. FOSTER

BOOK REVIEWS **(from page 63)**

with the Tokonoma or family altar recess, so much a part of the Japanese home.

The hanging type of arrangement, of which there are three, are charming; and I am thinking we have entirely neglected this class in our flower shows. Such possibilities!

The commendable use of garden flowers (in most of the arrangements) and simple line containers puts it all within reach.

The plates and explanations on mechanics is very well done, so that even a beginner can follow them. This is very important information and will come in handy often.

It was interesting to note that Mrs. Iwata, too, feels the need to get away from the highly stylized manner of arranging, which I thought was purely a product of our civilization. And I was turning toward Japanese flower arrangement to get away from it all!

DIANA GILBERT
Larchmont, N. Y.

CORN AND CORN IMPROVEMENT. Edited by George F. Sprague. 699 pages, illustrated, indexed. Academic Press, New York. 1955. $11.50

This is number five in a series of monographs prepared under the auspices of the American Society of Agronomy. Fourteen specialists in botany, agronomy, entomology, and biochemistry have contributed to this authoritative compilation of information about this most valuable plant in the Western Hemisphere.

The history and origin of corn is covered concisely by Weatherwax and Randolph. Conflicting theories are presented fairly, but they cannot accept the thesis of Mangelsdorf and Reeves that corn originated in South America from a relatively recent hybridization between some primitive form of *Zea* and *Tripsacum*. They say: "There is very little cytogenetic evidence of such admixtures of germ plasm. Structural uniformity of the chromosomes in varieties of corn from widely separated localities in the United States, Central America and South America, and the regularity of synaptic association in corn-teosinte hybrids are proof of the absence of inversions, translocations, or other alterations in chromosome morphology ordinarily involved in species crosses. Mutation and selection offer a simpler explanation of the variability that is characteristic of cultivated varieties of corn."

Vegetative morphology is well described and illustrated by John E. Sass. The photomicrographs are excellent and well selected. The structure and development of the reproductive organs is clearly presented by Paul Weatherwax.

Maize has contributed greatly to cytology and genetics of the higher plants. One of the foremost authorities in his field, M. M. Rhoades, gives a concise and informative review of the important and recent contributions in this field.

Probably the most useful part of this book is the excellent review of corn breeding methods by the editor, G. F. Sprague. After a long period of selection based on several different systems, many widely different cultivated varieties of corn came into existence. Further improvement, however, had to wait until basic knowledge of heredity was available. With this information it was possible to devise entirely new methods, giving a more complete control of inheritance from the male as well as the female parent. A clearer understanding of heterosis also helped to utilize more fully this important aid to increased production. Further advances also make possible the elimination of the onerous and expensive task of detasseling. The author closes the chapter by saying: "It would appear that a much greater expenditure of time and money could well be devoted to a detailed study of theoretical problems to ensure a sound basis for further development."

Mineral nutrition is described by J. D. Sayre and climatic requirements by R. H. Shaw. Necessarily these topics are discussed briefly. The important findings of Huntington, Williams, and Valkenburg, summarized in their *Economic* and *Social Geography* are not mentioned. To the reviewer this is most unfortunate, as they give much new evidence on the relation of geographic factors to the production of corn and other important crops. They show clearly that the yield of corn and other crops depends on the weather of the whole year. Many of the effects are indirect.

Corn culture is briefly but well covered by G. H. Stringfield. Production of hybrid seed is given by J. M. Airy, who is well qualified to write this chapter as an associate with the Pioneer Hi-Bred Corn Company. This company was one of the first to produce hybrid seed on a large scale. It did not produce the first hybrid seed to be sold commercially, as stated, because this was done by George S. Carter at Clinton, Connecticut, in 1921. His Double-Crossed Burr-Leaming was advertised in the "Rural New Yorker" and Wallace's "Farmer."

Popcorn and sweet corn are dealt with by A. M. Brunson and G. M. Smith. Both have made outstanding contributions in this specialized field.

The pests of corn are numerous and destructive. The nature and control of diseases and insects are well summarized by authorities in this important work, A. J. Ullstrup and E. F. Dicke. Much useful information is brought together in a readily available form.

Industrial utilization, nutritive value, and world production of corn by the editor and B. H. Schneider complete the volume, making it the most useful single reference book on corn at the present time.

DONALD F. JONES
Dept. of Genetics
Conn. Agr. Exp. Station
New Haven, Conn.

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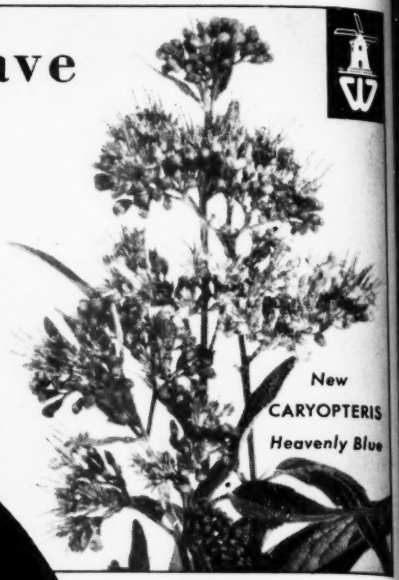

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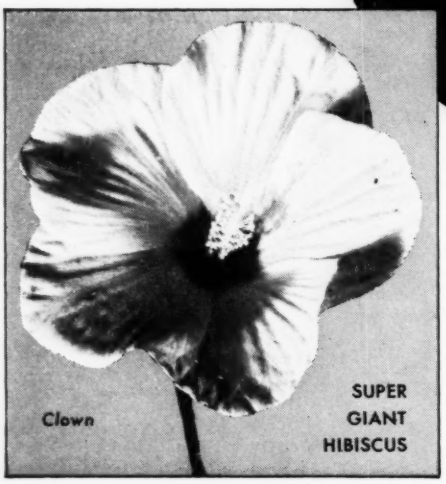

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